

JUL 24 1958

THE RAILWAY GAZETTE

Price Two Shillings

FRIDAY, JULY 4, 1958

Annually £5 by post

When you hear of NEW DEVELOPMENTS—

UNIVERSITY
OF MICHIGAN

JUL 23 1958

TRANSPORTATION
LIBRARY



think of R.T.B

The illustration, with some latitude, serves as a reminder of RTB tinplate, black sheets and specially coated sheets—together with a corrugated 'Speltafast' galvanized sheet and, behind them all, a large electrical lamination, made by RTB from one of their special steels.

Our history comprises a long sequence of developments which have proved of far-reaching importance to industry and to the general public. In steel making, in the production of tinplate, sheet steel and strip, in the manufacture of special steels and laminations for the electrical industry, and specially coated sheets, the name of RTB has always been associated with leadership.

The latest RTB development is the installation of the largest continuous-galvanizing unit in this country—for the production of 'Speltafast' galvanized strip and sheets.

Richard Thomas & Baldwins Ltd.

R.T.B



protection

DOWTY
hydraulic
BUFFERS



DOWTY HYDRAULIC UNITS LIMITED · ASHCURCH · GLOS.

THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer • TRANSPORT • The Railway Petrol
The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.
RAILWAYS • ESTABLISHED 1838 • THE RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.

Telephone: WHitehall 9233 (20 lines) Telegrams: "Trazette Parl, London"

BRANCH OFFICES

GLASGOW: 139, Bothwell Street, C.2 Central 4646

NEWCASTLE-ON-TYNE: 21, Mosley Street Newcastle-on-Tyne 22239

MANCHESTER: Century Insurance Building, St. Peter's Square Central 7667-8-9

BIRMINGHAM: 90, Hagley Road, Edgbaston Edgbaston 2466

LEEDS: 70, Albion Street Leeds 27174

BRISTOL: 8, Upper Berkeley Place, Clifton Bristol 21930

Annually £5 by post.

Single copies, Two shillings.

Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 109]

FRIDAY, JULY 4, 1958

[No. 1

CONTENTS

	PAGE
Editorial Notes	1
Parliament and the B.T.C. Report	3
Remedies for the U.S.A. Railway Situation	4
The Level Crossing Problem	4
Canadian National Railways in 1957	5
British Transport Commission Traffic Receipts	6
Letters to the Editor	6
The Scrap Heap	7
Overseas Railway Affairs	8
Experience of Undulatory Wear of Rails	10
British Transport Commission Results for 1957	11
Railway Axle Journal Lathe	14
Electric Traction Section	15
Personal	21
New Equipment and Processes	24
News Articles	26
Contracts and Tenders	29
Notes and News	29
Railway Stock Market and Official Notices	32

The Only Way?

THE Transport & General Workers' Union has been offered an increase of approximately 3 per cent for 11,000 of its members employed in the country and on maintenance work by the London Transport Executive. This proposal—more specifically, 5s. a week for country crews and maintenance men, and 7s. 6d. a week for Green Line coach drivers—probably would have been matched in due course by an increase for provincial busmen. It has been rejected by the unions and no further talks had been arranged as we closed for press. In our editorial article "Time Limit" of June 13 we defined the basis of the bus strike as the determination of the men to maintain the nominal value of their wage differentials in the face of that of the London Transport Executive to preserve the proportional differential. Mr. Harold Watkinson, Minister of Transport & Civil Aviation, stated recently that "nobody has gained anything" (from the strike). Nevertheless, in rejecting the decision of the Industrial Court and obtaining the offers to the "excluded staff" the busmen may be thought to have gained the principle, although they would probably have done better to have

exercised patience. In the light of the 3 per cent agreement with the railwaymen it is unlikely that the busmen ultimately would have lagged behind. Public comment has relinquished its discussion of the wisdom of wage increases and is tending to the viewpoint that the Government should permit a corresponding rise in charges. As we pointed out last week, such action is probably essential if the wages bill is to be met without the imposition of economies which will react very seriously on bus services. The new situation may demand a new Government attitude. In allowing Sir John Elliot, Chairman of the London Transport Executive, to provide increases over and above those awarded by the Industrial Court, the Government was aware of the Executive's financial position and its inability to pay the whole of those increases under present conditions of revenue. If the Government had intended to stand firm on its policy it should not have empowered Sir John Elliot to make his recent offers. To make him the scapegoat in a situation which basically was not of his making is unfair.

British Railways Locomotive Building Programme

THE small proportion of steam locomotives to the total motive power being built for British Railways in their own works and by outside builders is shown in the construction programme for 1958; particulars are given on another page. All the 63 steam locomotives are of the standard class "9" 2-10-0 heavy freight design, and it is likely that this class will achieve the distinction of being the last steam locomotives to be built for British Railways. As far as the 484 diesel locomotives are concerned, some of them appeared in the 1957 schedules, published in our issue of March 15, 1957, and it is clear that the delivery dates, given when they were first ordered, have not been maintained in some cases. Even where the design has already made its appearance on British Railways, the 1958 programme shows several locomotives of the batch concerned outstanding, which appeared in the list for last year; this applies to construction in railway works and by private builders. The programme for the current year has been issued half-way through, presumably because of some uncertainty as to the financial resources to be made available. As now published, moreover, it is subject to modification.

L.T.E. Enterprise to Gain Traffic

VIGOUR and enterprise have long been shown by the London Transport Executive and its predecessors in promoting traffic by means of special facilities. A new kind of cheap ticket, affording unlimited travel over the 1,776 miles of Central bus and trolleybus routes and 234 miles of Underground railway is to be initiated by L.T.E. tomorrow (Saturday). The object is to create week-end traffic. The ticket is called the "Twin Rover," to distinguish it from the existing 5s. "Red Rover" ticket, which is available on L.T.E. Central and country buses. The cost, 8s. 6d., is moderate; it will be available for one complete day, a Saturday or Sunday, and on bank holidays. The Underground line not included is the Metropolitan north of Rickmansworth—a country line with some suburban traffic. The efficacy of the new ticket in creating business depends largely on the amount of ordinary fares lost, as has been found, we believe, by transport undertakings in several countries which have tried similar methods. The London Transport staff concerned is skilled in assessing the profitability of this kind of venture, which has every chance of success.

Diesel Traction Progress in Rhodesia

DIESEL haulage of all, or most, trains on their recently completed South East line is stated by Rhodesia Railways to be imminent. The line affords a direct connection between the Rhodesias and the port of Lourenço Marques, in Mozambique. The increased capacity resulting from diesel traction will be useful. Twelve 2,000-h.p. diesel-electric locomotives are being delivered by the

English Electric Co. Ltd.; enough are expected to have arrived to work trains on the Bulawayo-Malvern line very shortly. Maintenance and fuelling facilities are being provided at Bulawayo and by arrangement with the Mozambique Railways the locomotives will be able to re-fuel from a specially built plant at Malvern. A 7,000-gal. fuel tank has been commissioned at Salisbury. It will facilitate the interchange of locomotives between Bulawayo and Umtali.

Expansion in Brazil

THE scope for British enterprise in equipping the Brazilian railways seems unlimited, as the railway system develops with the expanding economy of the country. Material already supplied or being delivered from Britain includes electric rolling stock and overhead and feeder equipment, and signalling equipment. The rapid development of Sao Paulo has resulted in electrification around that city. Conversion of the Central Railway Sao Paulo suburban lines was completed last month, except for the Poa-Itaim section. The overhead equipment for this is to be ready in August; until then the electric trains will be hauled by diesel locomotives. The Central Railway Rio suburban lines are being rehabilitated throughout, including the permanent way. The same administration in extending its lines from Pirapora, in Minas Gerais, to Brasilia, the new Federal District, is reconditioning the permanent way.

Overseas Railway Traffic

RAILWAY receipts of South African Railways & Harbours in the week ended April 5, 1958, were £2,894,902 compared with £2,879,426 in the corresponding week of 1957. Receipts in general continued to rise above the previous year's figures in the following weeks, and at May 31, aggregate receipts from April 1 were £24,843,991 compared with £24,195,449 in the corresponding period of 1957. Harbour receipts have declined slightly since the beginning of the financial year and at May 31 the aggregate was £1,482,097 compared with £1,485,657 in the same period last year, but Airways receipts have maintained a steady increase with aggregate receipts at May 31, some £750,000 up on the corresponding figures for 1957. East African Railways & Harbours approximate railway revenue for April amounted to £1,527,000 compared with £1,372,000 in April 1957, an increase of £155,000. Total revenue for the first four months of this year was approximately £6,476,000 compared with £5,757,000 last year. Costa Rica Railway receipts for April were colones 2,124,507 compared with colones 1,633,083 for April 1957, an increase of colones 491,424. Aggregate receipts from July 1, 1957, amounted to colones 18,829,174 (colones 16,144,710).

Examples Set by Indian Railways

THE progress now being made in the several technical spheres by the railways of India and Pakistan must be considered in relation to the pioneer work performed by the British officers who served the Indian railways so long and so well. One of them, Mr. T. T. Lambe, reminded many of his former colleagues at the Indian State Railways Reunion Dinner last Friday of some of the ways in which Indian practice had set an example to railways in Britain and elsewhere—for example, in the fitting of goods stock with vacuum brakes and in standardised design of wagons. In a remarkably informative speech, summarised on another page, he mentioned some new developments, notably the trends in coal and mineral wagon construction; also a project for a deep-water port for coal and ore traffic on the right bank of the Hooghly below Calcutta, to be served presumably by the South Eastern (virtually the former Bengal Nagpur) Railway, which also serves the Bengal and Bihar coalfield and steelworks. It is encouraging to hear of high standards of diesel locomotive availability and of wagon maintenance.

Railway Benevolent Institution Centenary

DURING the past century, the Railway Benevolent Institution has distributed nearly £5,000,000 in the relief of distress among British railwaymen, and, despite the activities of the Welfare State, it still finds ample scope for helping those cases of hardship which escape all but the personal touch of the voluntary organisation. The Institution is a good example of philanthropy combined with self-help. The movement began at a meeting in Camden Town on March 5, 1858, when it was decided to establish a fund for the relief of the widows and orphans of railway officers; the first officials were elected on May 8. Membership was extended to all ranks in June, 1865. An orphanage at Derby which had been established by the Amalgamated Society of Railwaymen in July, 1874, was absorbed by the institution of 1881. The latest extension of the work was the opening on June 12, 1948, of a home at Dorking for the elderly unable to live alone. From the outset, membership of the institution has been on a contributory basis. Every monarch from Queen Victoria to King George VI was a Patron, and on December 29, 1949, the institution was granted a Royal Charter. The present Queen is an annual subscriber, and the Duke of Edinburgh is the President for the centenary year.

Concrete Blocks in Post-Tensioned Girders

THE method of reconstruction adopted by the London Midland Region for the four-track underline bridge to carry the Manchester-Crewe line, now being electrified, over Stockport Road, Manchester, is not new. It is remarkable, however, for the size of the pre-cast units forming the four post-tensioned concrete girders, one for each track. The reconstruction work is briefly described elsewhere in this issue. Each box unit weighs some 35 tons, so that the weight of each beam will be over 500 tons. The units are joined by cast-in-situ diaphragms and then post-tensioned with 16 Magnel-Blaton cables each containing 72 wires 0.276 in. dia. giving a total pre-stress force of 3,600 tons. This method was chosen because by using pre-cast units there is a saving in time which will minimise interference with train services. When completed the bridge will be one of the largest in the country to be erected in this way. It replaces two separate bridges which were not suitable to carry ballasted track for the electrification of the line.

New Channel Car Ferry

THE new cross-channel car-ferry, the *Artevelde*, described elsewhere in this issue, has been brought into service between Dover and Ostend, by the Belgian Marine Administration, to meet the increasing demand of car traffic to the Continent. Car traffic began on this route in 1921, when 243 cars were conveyed, and, apart from the war years when the service was suspended, the numbers have grown rapidly; 4,694 vehicles were carried in 1935, 27,422 in 1955 and 37,953 last year. Two car-ferries now operate on the route, the other being the *Princess Josephine-Charlotte*. The Southern Region of British Railways also operates a car-ferry service between Dover and Boulogne with two vessels and between Dover and Dunkirk with four vessels, two of which are jointly owned with the French National Railways, and ply under the French flag. The *Artevelde*, which carries 160 motor-cars, 7 coaches or caravans, and 1,000 passengers, is fitted with automatic stabilisers. Between the two garage decks there is a specially designed folding ramp, which is closed when the upper deck is full. Drivers are permitted to drive their vehicles on and off the ferry under direction of the crew. They are assisted in parking by two turntables.

Suburban Electrification in New South Wales

THE considerable saving in operating costs being achieved by New South Wales Government Railways with 1,500-V. d.c. electrification is emphasised by the decision

to electrify two suburban branch lines, the Carlingford line northwards from Rosehill, and the industrial spur to Sandown, at a cost of £250,000. Annual savings through electrification are estimated at £50,000, so that the outlay would be recouped in five or six years. Major works associated with the electrification entail re-laying both branch lines and strengthening the bridge crossing the Parramatta River. Where necessary, platforms will be lengthened to accommodate the four-car suburban electric trains that will operate during peak periods. Off-peak trains will consist of two-car sets, all of which will operate a shuttle service from Clyde. Existing passenger services are provided by diesel railcars supplemented by steam-hauled trains during peak hours. Both lines traverse rapidly developing residential and industrial areas, and the improved services provided by electrification will no doubt contribute to this development. The target date for completion is December, 1959.

Electrification Round Barcelona

ELECTRIC operation of railways, as distinct from tramways or lines of tramway character, began in Spain apparently in 1911 when the 6,000-V. three-phase system was applied between Nacimiento and Gador, where it is still in use. In 1924 the then Northern Railway adopted the 3,000-V. d.c. system for the very difficult section between Ujo and Busdongo, through the Pajares pass, but for some time, for other new work, a voltage of 1,500 was selected and used extensively, as for example between Madrid, Avila and Segovia, Alsasua and Irún, and round Barcelona. A few years ago it was decided to adopt a voltage of 3,000 for new routes and to convert existing electrified sections to 3,000 V., especially where they connected. This policy has been applied to what is called, from the configuration of its routes, the "Catalan Eight," leading north-east and south-west from Barcelona, on which traffic is rapidly developing. Conversion of an additional section, completing the "Eight," is described elsewhere in this issue.

Parliament and the B.T.C. Report

IT was to be expected that Members on both sides of the House would wish for a Parliamentary debate on the report and accounts for 1957 of the British Transport Commission, in view of the special responsibility of Parliament for the nationalised transport undertaking. The latter has been the subject from time to time of much disturbing legislation, and on its affairs the incidence of Government policy has probably been greater than on any other of the industrial nationalised corporations. The adverse financial results for 1957, with which Members must be concerned, cannot be divorced from these influences, and Parliament shares some of the responsibility for them. Alone among the nationalised industries the Commission now has its losses financed out of monies voted by Parliament. It is therefore under an even greater obligation to account to Parliament for its stewardship, and M.P.s. are equally obliged to judge the rendering of that account.

Under the Transport (Financial Provisions) Act 1957, Parliament authorised the Minister of Transport to advance up to £250 million to meet the Commission deficits for the seven years 1956-62, and interest on these borrowings and on certain capital expenditure, which can be borrowed under the same measure, but which are not included in the maximum amount. For 1956 and 1957, deficits to be met from these borrowings total just under £118 million, leaving only £132 million available for the next five years, 1958-62. If this remaining amount proves insufficient Parliament presumably would be asked to raise the ceiling placed on deficit borrowing, but the Government has made it quite plain that it will not do so, and that any higher deficits arising from increased costs, including increased wages, must come out of economies and greater efficiency. At the same time it denies the Commission the obvious means of attempting to narrow the gap by

raising its charges, though the extent to which that would help, in view of consumer resistance, naturally is limited.

The Chairman of the Commission, Sir Brian Robertson, has expressed his confidence in the ability of the Commission ultimately to achieve the objective of the White Paper on the railway modernisation programme, and to break even by 1962. The immediate outlook, however, is not cheerful. In view of the higher costs the Commission now faces, as a result of recent wage increases, falling traffics, particularly in railway freight, and the losses from the bus strike, the deficit for the current year may well be of the same order as for 1957. If so, it will substantially reduce further the sum allocated to finance the deficits, and what remains can hardly be adequate to meet losses over the remaining period. Parliament will ask, therefore, not only what action the Commission is taking to remedy this state of affairs, but what the Government policy is in face of this serious situation. Hence pressure for a debate. Government Members will blame nationalisation of transport; and the Opposition will blame recent Government policy for the Commission's predicament. Both would be wrong. Nothing is to be gained from a political partisan approach.

A major trouble of nationalised transport is the declining proportion of total traffics offering attracted to the railways. Other railways throughout the world are experiencing this. Sir Brian Robertson places his hopes in implementation of the modernisation programme, which is now largely restored to the level authorised before last year's capital cuts. The report contains frequent references to the retardation of works that resulted from these cuts; but in many directions the programme is now ahead of the schedule laid down in the White Paper. In view of the importance of the railways to the Commission revenues it is significant that its other activities, as we commented last week, mostly did better last year, and together earned a surplus, before allowing for central charges, sufficient to reduce the railways deficit of £27.1 million to one of £3.7 million for the Commission as a whole, which is no mean achievement.

From this no doubt the Opposition will point the conclusion that the basic principle of the 1947 Act, the operation of the nationalised transport industry as a single integrated whole, is justified, and that but for Governmental interference, particularly in partial de-nationalisation of road haulage, the fortunes of the Commission would be in better shape. Whether or not this claim can be substantiated is immaterial. Both political parties have interfered, sometimes with unfortunate results, in nationalised transport. It would be a mistake to accept that all was well with its finances or organisation when the Labour Government went out of office in 1951. Recrimination leads nowhere. The usefulness of Parliamentary debate would be in the serious assessment of the Commission's present position and an objective consideration of its future.

Whatever Government may be responsible for transport policy in the coming years will have to make decisions vital to the future of the railways and other nationalised transport undertakings. Action must be determined with a view to redeeming the position with the minimum disturbance to the transport industry as a whole. Even if Sir Brian Robertson's expectations are fulfilled and the Commission achieves financial equilibrium by 1962, there will still be a large accumulated deficit, and the interest liability thereon, to be dealt with. The Special Account, which also includes the 1955 deficit and the accumulated interest on the deficits and on borrowings for capital purposes, already amounts to £202 million; and by 1962 there will be added the balance of the permitted deficit borrowing, plus accumulated interest; this could exceed £400 million. This is the prospect which Parliament must face boldly. Although the future of the Commission cannot be settled by a single debate, enlightened and purposeful discussion in Parliament can serve the useful purpose of directing attention to the situation and causing some hard thinking about it. It is therefore to be hoped that time for it can be found before Parliament adjourns for the summer recess at the end of this month.

Remedies for the U.S.A. Railway Situation

LESS has been heard of ways to remedy the plight of the U.S.A. railways than of the seriousness of the situation. Two sets of proposals have been made recently, one by Colonel S. H. Bingham, O.B.E., well known as an exponent of railway transport on a large scale in the urban (New York) and military fields, and the other by a sub-committee of the Senate.

Colonel Bingham expressed his ideas in an address to a body that has wide influence in the world of finance and business in the industrialised Eastern area of the U.S.A., the recent annual convention of the New Jersey Bankers' Association. Outlining the problem, he pointed out that the position of the railways, although they were still the largest carriers of freight, was becoming steadily worse because of Government regulations and the subsidised character of competing means of transport. The railways are ravaged, he considers, by regulations, taxes, rates, and subsidised competition. The restrictions are so onerous that the basic asset of the railways, their ability to transport huge bulk consignments efficiently, is being nullified. Since November, 1956, the cost to the railways of labour and materials has risen by \$870 million a year. In 1957, net railway operating income was 14 per cent lower than in 1956 and net income after fixed charges was some 19 per cent lower. This has seriously affected the ability of the railways to invest in improved plant and services.

To obtain an efficient air transport system, he advocates, as do many people in other countries, co-ordination of all methods of transport so that each type can be used in its most suitable capacity. Piece-meal planning, he believes, must be replaced by a broad, unified planning of all facilities. What has been termed the "Bingham Formula," put forward in 1952, envisages the acquisition by Federal, State, or local governments of railway or urban transit properties in return for revenue bonds issued for a term of perhaps 20 years. A quasi-public transportation corporation would be established; on its board of directors there would be Government and bondholder representation. Day-to-day operation and management would remain in the hands of the existing private management, provided that it was efficient. Many existing restrictions would be lifted from the railways. Even if faced with the prospect of something like a shutting-down of a considerable part of the railway system, we doubt whether public opinion in the U.S.A. would countenance anything in the nature of a national public transport corporation. A Federal Department of Transportation is proposed. This would administer a national policy, and there would be some standardisation of railway equipment.

Valuable existing railway rights-of-way in cities, if railway suburban ("commuter") traffic fell, would be used for extensions to rapid transit system. In New York, Colonel Bingham suggested, full use of the Hudson and Manhattan railway facilities, now recommended for partial abandonment, might obviate the need for the proposed \$500 million transit loop with its tunnels under the Hudson River.

Recognition by the Government of the seriousness of the plight of railways in the U.S.A. has been grudging. Statements of the facts have been called for from time to time, but little action has followed. It may be that the administration soon will be compelled to take the bull by the horns. The future of the railways will be affected for the better if action is taken on the recommendations of the recent report of the Senate Sub-committee on Surface Transportation. Commonly known as the Smathers Committee, from the name of its chairman, Mr. G. A. Smathers, a Senator of Florida, the reporting body is a Sub-committee of the Senate Committee on Interstate & Foreign Commerce. Its recommendations stem from the evidence it took from many presidents of railway companies and representatives of other forms of transport during the early months of this year.

The sub-committee was appointed in view of the rapidly deteriorating situation of the railways, which became evident towards the end of 1957. With the continuing recession, now believed to be levelling out, it cannot be

claimed that the position improved during the first quarter of the current year. Official figures for the first three months of 1958 show that, while total operating revenue fell by just over 13 per cent, total operating expenses, in spite of the very drastic measures taken by many lines, especially in the Eastern States, could only be reduced by 7.4 per cent. As a consequence, net operating revenue decreased by over one-third, when compared with a similar period of 1957 and net railway operating income, after deduction for taxes and other charges, fell by no less than 60 per cent.

The Smathers Committee made 11 recommendations. They are based on the assumption that the railways are vital to national security; in the war of 1941-45, they handled 97 per cent of organised military passenger movements and 90 per cent of all military freight traffic.

In brief, the sub-committee proposes to give more authority to the Interstate Commerce Commission over interstate rates, and over abandonments of unprofitable services. Clarification of what is illegal in respect of for-hire carriage is recommended, and repeal called for of the Federal taxes on public transport services, passenger and freight. Establishment of a plan of guaranteed loans to the railways is proposed, as is provision for tax-deferred construction reserve funds to stimulate capital investments. Further expansion of the exemption from regulation of agricultural products moving by road is to be halted and possibly reduced so far as frozen fruits, vegetables, and so on are concerned. Permission to depreciate railway property in 20 years and provision of equitable treatment between the several means of transport for the carrying of mails are further recommendations. The Interstate Commerce Commission determination of reasonable minimum rates is to be based in future on the facts put forward by the proposing carrier, rather than on the effects on other means of transport. Finally, it is suggested that a study group of three men be appointed, which should report on transport policy within a period of a year and a half.

The Level Crossing Problem

THE opening last week by the Queen of the overline road bridge replacing the Pelham Street level crossing near Lincoln passenger station directs attention once more to the level crossing problem. In this country Parliament has not for some years, except in special circumstances, allowed a public road crossing to be made over any new or existing lines except those built under Light Railway Orders. There are still, however, some 4,250 such crossings and also about 21,300 occupation or accommodation crossings.

The railway has never had any special obligation, at accommodation or occupation crossings, towards the users, except by negotiated agreement, beyond providing gates and some means of fastening them, and an adequate surface on which vehicles can cross. Users are responsible for their own safety and must satisfy themselves that no train is approaching before crossing the line. With public roads the situation has long been entirely different. By an Act of 1845, supplemented by one of 1863, railways were obliged to maintain gates and keep staff to attend to them, for which accommodation had to be provided. They were held liable for any injury or loss attributable to any defect in the equipment, or the mistake or carelessness of a gate-keeper. The financial burden on the railways so entailed has been growing constantly heavier. By 1957 it was over £1,000,000 annually for wages alone, about five times the sum paid in 1938. There is also the cost of maintaining gates, which often must be moved by mechanical, or at times power, equipment. The original intention of Parliament was to protect road users. Today there is difficulty in recruiting staff of the standard required for carrying out such responsible duties efficiently. The risks associated with collisions with road vehicles began to change when the internal combustion engine was introduced, for the steam rollers and traction engines which existed before that were only a small part of road vehicles.

Delays to road traffic at crossings are bound to be

greater than is essential for safety as the personal factor enters into the operation of the gates. Some form of automatic warning or control, or both, alone can eliminate such a variable factor; but to introduce it necessarily involves departing from long-established practice, and some modification of statutory obligations. While British methods in the construction of crossing gates have been followed in some parts of the world, in others the lifting barrier commonly has been used. The latter lends itself more readily to remote control, or automatic operation, say by track circuiting, applied for some time now in America and on the Continent, where open crossings with flashing warning lights and/or notice boards also are seen. Barriers were authorised for trial at a special location in Great Britain in 1947—having been used already on private industrial lines at a few places—and for general use, with the approval of the Ministry of Transport, in 1954. The requirement of the Act of 1845, however, that public crossings should be staffed, remained unaffected.

As the adoption of some of these arrangements offered the prospect of reducing the financial burden without sacrifice of safety, the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, in 1956 sent a working party to visit certain countries and report. This resulted in the British Transport Commission obtaining an Act in July, 1957, giving the Minister comprehensive powers to sanction the use at selected locations of any of the types of equipment seen by the party, or such variations thereof as should appear to him advisable, provided risk of mishap was in no way increased. It is fully recognised that there are places where any such change would be inadmissible.

A partial application of these methods is at present all that can be envisaged, but the way is open to effecting appreciable savings in expense. Already the Minister has, after consultation between his Inspecting Officers and the Commission, issued provisional requirements covering the use of lifting barriers at manned, remotely controlled, and automatically protected crossings; also the application of open crossings, without gates or barriers, on public roads.

Canadian National Railways in 1957

IN the report of the Canadian National Railways board for the year 1957 to the Canadian Minister of Transport, a copy of which has been sent us, Mr. Donald Gordon, Chairman, calls attention to the fall in operating revenues compared with 1956. Receipts fell from \$774,800,000 to \$753,200,000 against an increase in operating expenses from \$703,300,000 to \$734,600,000. The net operating revenue was thus only \$18,600,000 (\$71,500,000), the figure in brackets being for 1956. As a provision of \$11,200,000 had to be made for taxes and rents and \$37,000,000 for fixed charges, there was a deficit on the year's working of \$29,600,000. There was a surplus of \$26,100,000 in 1956.

This result is ascribed generally to the growing disparity between increases (a) of wage and material costs on the one hand and (b) of freight rates on the other. For if the 1957 results were re-stated in terms of the 1951 average revenue per ton-mile, average prices and average hourly earnings, there would be a surplus of nearly \$30,000,000. The ever-increasing deterioration in the balance between costs and revenues is specially serious as it obscures improved operating performance and jeopardises prospects of the company's being able to pay its way taking the good years with the bad.

Although freight traffic in ton-miles decreased by 12.5 per cent the corresponding fall in freight revenues was only by 4.2 per cent due to increased rates. On the other hand, passenger revenues rose for the third year in succession, in 1957 by 2.1 per cent despite a fall in the number of passengers carried. A substantial increase in the average distance a passenger was carried as well as higher fares were responsible for this result. Over one-third of the nearly 14,000,000 passengers were commuters and their numbers declined by 11 per cent. Express business revenues, though not quite equal to those in the record previous year,

amounted to \$42,200,000. Mail revenues increased to \$10,500,000 or by 12.8 per cent.

The \$31,300,000 increase in operating expenses was caused mainly by a rise in wage and material costs of \$31,800,000 and higher depreciation charges. Track and structures maintenance was \$13,400,000, 9.5 per cent, higher than in 1956 due largely to main-line improvements in the Western Region. The following are some of the principal results of 1956 and 1957:—

	1956	1957
Passenger train-miles	24,268,051	23,820,127
Goods train-miles	47,944,638	42,073,087
	\$	\$
Freight revenue	631,880,409	604,932,271
Passenger revenue	56,397,814	58,035,602
Total operating revenue	774,800,647	753,165,964
Operating expenditure	703,303,562	734,556,041
Net operating revenue	71,497,085	18,609,923
Taxes, rent, etc.	24,705,275	20,658,337
Interest on public bonds	26,472,551	24,766,117
Government interest	3,786,009	11,049,277
Surplus (+) and deficit (—)	+26,076,951	—29,572,541

Capital expenditure on improvements during 1957 totalled \$204,655,095 after allowing for property retirements. The principal items were equipment \$139,643,428, track improvements \$55,204,784, communications facilities \$12,354,808, roadway buildings \$8,218,874 and large terminals \$6,170,977. Three new lines were being constructed: (1) the 161-miles from Beattyville to Chibougamau was officially opened in November, and, linked with it, (2) the 133-mile section from St. Felicien to Cache Lake was well in hand, both in Quebec, and (3) in New Brunswick a 23-mile line was opened from Bartibog to Heath Steele. In Manitoba the C.N.R. administration took over the working of the 31-mile branch from Sipiwek on the Hudson Bay line to Thompson, the International Nickel Company's mining area. Also in Manitoba a new branch line was being surveyed from Optic Lake to Chisel Lake, 52 miles.

The sidings-lengthening programme progressed with targets in 1958 for all sidings between Montreal and Winnipeg to hold 100-wagon and between Winnipeg and Edmonton 117-wagon trains. Over 4,000 miles of the trans-continental main line had been equipped with C.T.C. before the end of 1957. It was also extended to or on other lines. In the company's long-term policy of concentrating train-marshalling at strategic points, three great yards were in hand or proposed. Earthwork was in hand for the formation at Cote de Liesse yard in Montreal, and land was acquired for the other two at Moncton and Winnipeg. The speciality of these yards is that traffic arriving will be regrouped in a circulatory system with semi-circular loops at each end of the yard to either a main or a local hump yard, and leave via one of two departure yards. All the latest equipment will be used including a diesel-locomotive repair shop.

On December 31, 1957, 1,433 diesel units were in service on the C.N.R. lines, and during the year under review 73 per cent of the freight gross ton-mileage and 58 per cent of the passenger car-miles were handled by diesels. A total of 6,439 new wagons and also 89 coaching vehicles were placed in service, including 14 diesel railcars and five "dinettes" cars. The railcars were used on inter-city services. Among many improvements in passenger services during 1957, there was a reduction of 1 hr. 15 min. in the schedule of the "Super Continental" westbound from Montreal, and 1 hr. 30 min. westbound from Toronto. The eastbound schedule from Vancouver to Toronto and Montreal was also reduced by 30 min.

The plan for the development of the 21-acre terminal area at the Central Station, Montreal—described and illustrated in our issue of February 21, 1958—was sanctioned. The new Queen Elizabeth hotel in Montreal was nearing completion in December. Technical research was responsible for a variety of improvements in railway equipment including rail-fastenings, locomotive wheels, coach upholstery, and new specifications were prepared for the purchase of rolling stock components and hotel furnishings. A heated box car was being designed to protect perishables

in winter whilst usable as an ordinary car at other times. Another box car has doors adaptable to the dimensions and loading characteristics of different commodities. A new operation research section was also inaugurated to apply to railway problems methods and techniques of applied science found valuable in other fields of activity.

Construction of the St. Lawrence Seaway affected the C.N.R. in several directions. A 40-mile diversion of the main line between Cornwall and Cardinal in Ontario was completed and opened for traffic. New highway approaches to the Victoria Bridge with lift bridges were necessary, as well as a railway diversion round St. Lambert lock, undertaken by the C.N.R.

British Transport Commission Traffic Receipts

"NIL" appears for the first time in a table of traffics during a four-week period: for No. 6, the four-weeks ended June 15, throughout which the strike was in progress, there were no London Transport road service receipts whatever. Underground traffics at £2,237,000 compared with £1,716,000 for the corresponding period of last year, and with £2,017,000 for Period 5, during only one-half of which was there a strike. This seems to show that most people who began to travel by Underground at the beginning of the strike kept to that mode of transport for the rest of the period. British Railways passenger receipts for Period 6 at £12,242,000 were £628,000 more than they were last year, and considerably more than for Period 5 (£9,553,000). In view of the seasonal increase to be expected in June, and of other factors such as fare increases, it is impossible to trace any effect of the bus strike.

	Four weeks to June 15, 1958		Incr. or decr.	Aggregate for 24 weeks		Incr. or decr.
	1958	1957		1958	1957	
Passengers—	£000	£000	£000	£000	£000	£000
British Railways ..	12,242	11,614	+ 628	57,387	59,600	- 1,213
London Transport:						
Railways ..	2,237	1,716	+ 521	11,390	10,896	+ 494
Road services ..	—	4,653	- 4,653	19,863	27,719	- 7,856
Provincial & Scottish buses ..	4,875	4,831	+ 44	25,624	26,406	- 782
Ships ..	593	614	- 21	2,050	2,012	+ 38
Total Passengers ..	19,947	23,428	- 3,481	116,314	126,633	- 10,319
Freight Parcels & Mails—						
British Railways:						
Merchandise & live- stock ..	6,812	7,747	- 935	44,537	52,335	- 6,798
Minerals ..	3,203	3,832	- 629	22,562	25,037	- 2,475
Coal & Coke ..	9,223	9,380	- 157	61,679	60,230	+ 1,449
Parcels, etc., by passenger train ..	3,933	3,823	+ 110	23,649	23,033	+ 616
Collection & de- livery, etc. ..	959	1,012	- 53	5,780	6,309	- 529
Total freight British Railways ..	24,130	25,794	- 1,664	158,207	166,944	- 8,737
Others* ..	4,220	4,213	+ 7	24,979	25,152	- 173
Total Freight, Parcels, & Mails ..	28,350	30,007	- 1,657	183,186	192,096	- 8,910
Total ..	48,297	53,435	- 5,138	299,500	318,729	- 19,229

* Inland waterways, freight, road haulage, and ships

Provincial and Scottish bus receipts at £4,875,000 slightly exceed the corresponding 1957 figure, and are, as might be expected, higher than for the preceding four weeks (£4,398,000). Ships' passenger traffics were still below last year's figure: £593,000 against £614,000. The drop as compared with 1957 is not as great as it was for Period 5. There is no indication that the fall in traffics was in respect of services to the Continent.

Railway merchandise and livestock, mineral, and coal class traffic receipts show a decline compared with last year and at £6,812,000, £3,203,000, and £9,223,000 compare with £7,638,000, £3,660,000, and £10,153,000 respectively for the preceding four weeks—depressing results indeed, though the Whitsun holiday must be taken into account.

PERCENTAGE VARIATION 1958 COMPARED WITH 1957

	Four weeks to June 15	24 weeks to June 15
British Railways—		
Passengers ..	+ 5.4	- 3.7
Parcels ..	+ 2.8	+ 2.6
Merchandise & livestock ..	- 12.0	- 14.9
Minerals ..	- 16.4	- 9.8
Coal & coke ..	- 1.6	+ 2.4
C. & D. services ..	- 5.2	- 8.3
Total ..	- 2.7	- 4.8
Ships (passengers) ..	- 3.4	+ 1.8
British Road Services, Inland Waterways & Ships (cargo) ..	+ 0.1	- 0.6
Road Passenger Transport, Provincial & Scottish ..	+ 0.9	- 2.9
London Transport—		
Railways ..	+ 30.3	+ 4.5
Road services ..	—	- 28.3
Total ..	- 64.8	- 19.0
Aggregate ..	- 9.6	- 6.0

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

Motive Power Economics

June 28

SIR,—The Norfolk & Western report for 1957 supplies a complete answer to Mr. Roger Boland's letter in your June 27 issue. Last year the N.&W. worked 87,492 gross ton-miles in a freight train-hour, 10.5 per cent above 1956 and 21.5 per cent above the figure Mr. Boland gives for 1953. The transportation ratio dropped to 29.2 per cent. The report says "diesel locomotives played an increasingly important role in the company's operations. These units handled 22.6 of the road freight gross ton-miles and represented 18 per cent of the total rated tractive power owned during the year. By the end of 1957, 170 units were owned and 30 more are scheduled for delivery in 1958." The Shenandoah Division, extending from Roanoke to Hagerstown, had been entirely dieselised. One of the principal officers subsequently stated that a 30 per cent saving was being made in the cost of working a return trip between the two ends of the Division by using diesel instead of steam power.

Mr. Boland's figures of coal consumption are not up to date. The A.A.R. bulletin of operating statistics for 1957 shows the N.&W. as using only 72 lb. in working 1,000 gross ton-miles, against 78 lb. in 1956. In doing the same amount of work 1.83 gal. of diesel fuel were used last year against 2.1 gal. in 1956 and consumption may fall further as the staff gain experience in dealing with the new motive power.

The Illinois Central is another large coal carrier, which was slow to try diesels, but had 520 units at the close of 1957. Its annual report said that the expanding use of diesels helped to show "a 6 per cent increase in gross ton-miles per train-hour, a reduction of 7 per cent in freight train-miles and a drop of 10 per cent in freight train-hours."

Another tribute to the efficiency of the diesel was the decision of the Pennsylvania Railroad to dispense with steam power at the end of November, apart from storing 135 steam locomotives for emergency use. At the close of 1957 the P.R.R. had in service 2,359 diesel units and 278 electric locomotives, the diesels providing 89 per cent of the total tractive effort available.

All the evidence proves that Mr. Boland's "really modern steam locomotive" will never be developed. The U.S.A. Class 1 railroads have not ordered a single steam locomotive since 1952, and the survey of the locomotive position on July 1, which the A.A.R. intends to make, is certain to show that an insignificant amount of steam power is then serviceable.

Yours faithfully,

R. BELL

Clacton-on-Sea

THE SCRAP HEAP

Travel-Minded Indians

According to recent statistics, one per cent of the population of the Republic of India travels daily, about 3,800,000 people. In 1941-42, when the train service was restricted at the height of the war, only 0.43 per cent of the population went by train daily—excluding, presumably, large movements of troops. By 1956-57, the percentage had risen to 1.06. In relation to average income and the distance from stations of many of the hundreds of thousands of villages in India, the amount of passenger travel has long been surprisingly high. The many season ticket holders in the Bombay, Calcutta, and Madras suburban areas must add considerably to the amount of daily travel.

The "Orient Express"

The "Orient Express" began running a little over 75 years ago between Paris and Vienna. Since the summer of 1883 the route of the "Orient Express" proper (as opposed to other European expresses such as the "Arlberg Orient" and the "Simplon Orient") has changed comparatively little; notably in avoidance, at one time, of Salzburg, and in the route followed between Vienna and Budapest, which has altered for political reasons. The eastern terminus has varied from time to time. The remotest point reached by "Orient Express" sleeping cars from Paris was Constanza, in Roumania, from which port there was for some years a connecting service of well-appointed steamers, operated by the Roumanian State Marine, to Istanbul and other Black Sea ports. Since the last war the "Orient Express" has ceased to be a *train-de-luxe* in the true

sense, that is to say, composed exclusively of Wagons-Lits Company sleeping, restaurant, and baggage cars.

The train has figured often in fiction, drama, and films. The small amount of descriptive literature on it in English includes amusing passages in "Express Trains, English & Foreign" by E. Foxwell and T. C. Farrer (1889).

A Rose By Any Other Name . . . ?

Visitors from London sometimes feel that New York's underground railways, known as the subway, look dirty by comparison with their own. But there is a possibility that before long it will be impossible to claim that they smell dirty. The city's Transit Authority reported to-day that it was experimenting with a deodorant which is supposed to fill the coaches with the scent of apple orchards.

The principal difficulty so far encountered is that the effects are not very lasting. "After a few minutes," one official confessed, "the subway cars still smell like subway cars." Efforts to achieve a more lingering effect will continue.—"Peterborough" in "The Daily Telegraph."

From Waterloo to the City

Those who pass by the Mansion House can scarcely fail to be reminded that the new electrical railways are steadily tunnelling their ways under the busy thoroughfares of the City. Few possibly realise, however, that within a few weeks it will be possible to leave Waterloo, dip under the Thames, and emerge at the Bank by means of the Waterloo & City Railway. The completion of the line will be hailed with

satisfaction by the public, who will be able to reach the City with far less loss of time than is entailed by the present arrangements.—From "The Financial Times" of June 13, 1898.

[The Waterloo & City Railway was formed as a separate company, but under the auspices of the London & South Western Railway, and was incorporated by Act of July 27, 1893. It was opened ceremonially by the Duke of Cambridge on July 11, 1898, and for public traffic on August 8.]

New Light on Locomotive History

Turning now to Great Britain, we learn that the 4-4-2 made her debut there in 1898 when H. A. Ovatt, the widely-known English locomotive designer, rolled out No. 990 for his Great Western Railway. This engine was the *Henry Oakley*—no kin to Annie Oakley, crack shot of the old American West.—From a historical article on Atlantic type locomotives in a popular U.S.A. railway journal.

Wrong Train ?

I was not in the least puzzled by the sound effects heard in "So I'll Tell You" (B.B.C. Light Programme, May 5) as it appears was D. A. Beacock (see *The Railway Gazette* of June 13, page 679). It is quite possible to go from Victoria to Lewes by steam train and without changing. Although it takes slightly longer, the route is far more pleasant than that of the electric train. Instead of the route East Croydon, Haywards Heath, Lewes, you go via East Croydon, Oxted, Tunbridge (sic) and Lewes. D. A. Beacock has only to follow the fishing rods on Victoria Station to find himself on a steam train to Barcombe Mills, one stop before Lewes.—From a letter to "The Radio Times."

The Midland & Great Northern Line

(See our June 20 issue)

Gloom descends upon East Anglia,
Twilight falls on field and fen.
They are ringing down the curtain
On the Midland & G.N.

Hereward, art thou still sleeping?
"Wake," they called you; stir you, then,
Ere the Drier Side of Britain
Lose its Midland & G.N.

There'll be no more friendly whistles
When the trains pass from our ken;
No more amiable amblings*
By the Midland & G.N.

Nature will resume possession,
Grabbing back its own again,
Bringing swift obliteration
Of the Midland & G.N.

As our days merge into morrows
Memory plies its mellowing pen;
May we get as good a "mention"
As the Midland & G.N.

A.B.

* The line was sometimes known as the "Muddle & Go Nowhere."

Electric Traction in the Isle of Man



Photo]

[D. J. W. Brough

At Snaefell Summit, on the 3-ft. 6-in. gauge Snaefell Mountain Railway: note design of turnout and of point lever

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Higher Freight Rates

Increased rates affecting all goods carried by the railways, including petrol, food, coal, and farm produce, were announced recently by Mr. Ben Schoeman, the Minister of Transport. He stated that it was necessary to increase revenue by £7,000,000 to meet the higher wages granted to railwaymen earlier this year.

The increases range from 5 to 14 per cent, and came into operation on July 1. In the 9 per cent category are fish, meat, margarine, butter, eggs, sugar, and petrol. The petrol increase will amount to about 8d. for every 10 gal. transported 500 miles.

Mechanical Coach Washing Plant

A new mechanised coach washing plant built by Emmanuel, of Turin, has been placed in service at Braamfontein, near Johannesburg. Installation, including civil and electric work, was by the S.A.R.; the winch for propelling vehicles through the plant and all components, were supplied by a Johannesburg firm. The plant is the first of its kind in the Union. It was the subject of editorial comment in last week's issue.

It is initially taking over exterior cleaning of the Reef electric suburban coaches, but subsequently it is intended to use for other types of coaches. It will ultimately supersede the manual washing at Braamfontein, except where the latter is necessary with inaccessible angles and crevices. Cleaning of exterior ends of coaches is continuing to be done manually. Coaches are drawn

up under ordinary electrical power and the winch with the propelling "mule" set in motion. Vehicles are then propelled at a speed of approximately one m.p.h. towards the plant. The first spray is pure water applied through rotating jets under pressure. This removes ordinary traffic dust, mud, and so on.

A few yards further on the detergents are applied to the coach simultaneously with the rotation of circular brushes. The time-lag between the application of the detergent and the coaches reaching the second pair of screens is designed to allow the detergent to act on the remaining dirt.

When the coaches reach the second pair of screens they are again subjected to treatment by rotating brushes, and finally given a thorough washing down with clean water under pressure.

All controls are housed in the control room above the plant.

There are suitable accommodation buildings at the suburban railway centres of Newport, Dandenong, and Westgarth. Tenders have been called for their removal to camp sites on the Melbourne-Albury line.

Some 400 men are working on the scheme and nearly £500,000 has so far been spent out of the total cost of £10,000,000. The first stage in the work has been the building of new bridges and culverts. The major undertaking of this nature at present is the construction of an 800-ft. bridge over the Broken River at Benalla; the largest bridge in the project. Work is well advanced, and six piers have been completed beside the original 80-year-old bridge, which carries the 5-ft. 3-in. gauge line. After bridge and culvert construction is completed, earth moving will be commenced.

Building Over Railway Tracks

Work will begin early next year on the construction of 15 blocks of multi-storey flats over the railway tracks at Jolimont, on the fringe of the Melbourne business area, at a cost of £A10,000,000. The scheme will be financed entirely by American capital.

VICTORIA

Standard Gauge Line Construction

Four new camps are to be established for workers engaged in the construction of the standard gauge railway from Melbourne to Albury. These will be at Wallan, 29½ miles from Melbourne, Broadford (46½), Longwood (84½), and Chiltern (168½). When the project started last November, camps were established at Wodonga, Barnawatha, and Euroa. Subsequently two more camps were established, one at Benalls and one at Seymour. These two, and the Euroa camp, are to be enlarged.

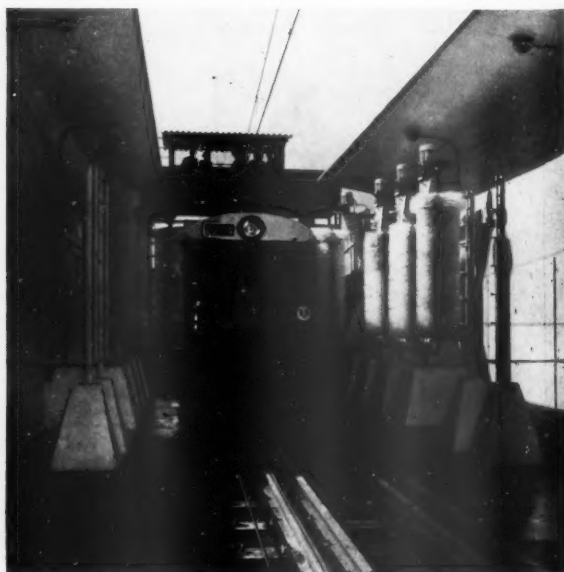
NEW SOUTH WALES

Electrification of Suburban Lines

Approval has been given by the State Cabinet to electrification of two Sydney suburban branches at a cost of £250,000. They are the Carlingford line, northwards from Rosehill, and the industrial spur to Sandown.



Start of washing operations: pure water sprayed through rotating jets. Note irregular profiles of older stock



Final stage in mechanical coach washing at Braamfontein, South African Railways, showing also control tower

Both lines pass through rapidly developing residential and industrial areas and the date for completion is December, 1959. Electrification entails relaying both branches and strengthening the bridge crossing the Parramatta river. Where necessary, platforms will be lengthened to accommodate four-car suburban electric trains that will operate during peak hours. Off-peak trains will consist of two-car sets, all of which will operate a shuttle service from Clyde.

It is expected that £138,000 will be spent on the project during the coming financial year. Annual savings are estimated at £50,000, and the outlay is expected to be recouped in five or six years.

CANADA

Extra Maintenance Staff

Nearly 1,500 extra men have been employed this summer in the Atlantic Region of the Canadian National Railways to carry out track, and bridge improvements throughout the Region. The extra workers augment the regular track maintenance force of 2,500 men. They are assisting in the installation of heavier rails, top-grade crushed rock ballast, signals, and in carrying out other track improvements.

Track improvements in recent years have permitted the operations of heavier trains at faster speeds. New and relayed rails will be installed on 143 miles of track, and 330,000 cu. yd. of

ballast, half of which will be high-grade crushed rock, on 115 miles of road bed. Cycled maintenance will be carried out on an additional 200 miles of line, 500,000 new sleepers laid, and 60,000 cu. yd. of earth and rock moved in bank widening.

UNITED STATES

Hot Axlebox Detection

On the New York Central System automatic hot box detectors have been installed for some time past alongside the track at Fairview, Pennsylvania, on the New York-Chicago main line, passed by up to 60 freight trains daily. Until recently the information as to hot boxes in passing freight trains had to be telephoned by observers at an office on the site to the dispatcher's office at Erie, the information is now passed by electrical means directly from the detectors to the office, 10 miles away. This gives the office ample time to stop for examination any train on which axlebox heating is developing.

A 20 kc. carrier, operating on the C.T.C. code line, is used to convey the signals; four frequency modulated tones are used for the detector outputs, one for each detector on the four rails of the double track. The Fairview site was chosen because there are three controlled sidings within 1½ miles to which trains with hot-boxes can be directed. With the abolition of the on-site observers, however, there is no longer any need to concentrate both sets of

detectors at Fairview; and it is intended to move those for the westbound trains to Angola, 22 miles west of Buffalo; this will make it possible for westbound trains with defects to be examined by the yard inspectors at Dunkirk.

The degree of heating is read in the dispatchers' office by a stylus marking a moving tape; during a three-week period recently, 70 abnormally hot journals were detected on 541 trains, a number of which were able to proceed after lubrication or the release of sticking brakes.

Gateway Yard, N.Y.C. RR.

The New York Central administration has spent nearly £11½ millions in the past 15 months upon the construction of three new classification yards. The third, serving the Pittsburgh-Youngstown area, is known as Gateway yard and cost over £2,500,000. It covers an area of 210 acres and contains 73 miles of track; it is equipped with all the latest facilities. Train classification and handling time has been halved by its completion and the use of electronic control of points and computing.

HUNGARY

Passenger Train Accelerations

Re-laying and doubling between Budapest and Balaton will enable passenger train timings between the capital and Lake Balaton holiday resorts to be cut by 30 min.

Publications Received

French Railways of To-day. By Vivian Rowe. London: G. Harrap & Co. Ltd., 182, High Holborn, W.C.1. 8 in. × 5½ in. 141 pp. Illustrated. Price 10s. 6d. —Although supplied by the French National Railways and French Railways Limited in London with some excellent photographic illustrations and much technical information, the author has failed to write a book of more than superficial value. Facts—some of considerable interest—are not presented in systematic order, and there are minor inaccuracies. An index is needed.

The Strength Properties of Plywood, Part 4. Working Stresses. By W. T. Curry. Forest Products Research Bulletin No. 42, Department of Scientific & Industrial Research: H.M. Stationery Office. 6 in. × 9½ in., 24 pp. Paper cover. Price 2s.—This, the fourth of Mr. Curry's works on this general subject, explains that various assumptions have to be made in calculating the strength of plywood. In structural design, values for the ultimate strength properties of plywood cannot be used directly in calculations and adjustments must be made for the influence of method of measurement on resultant strength values, and to allow for variability of the material. A margin of safety must also be provided. On

this basis test data made in previous investigations are analysed and suitable stress values are suggested for various species of timber used in plywood. The suggested stress values may be subject to alteration as further test data become available. Their use in the design of plywood elements is given in an interesting appendix to this bulletin.

Indian Railways, 1956-57. Ministry of Railways 8½ in. × 5½ in. 114 pp. + 58 pp. charts and statistical tables. Paper cover. No price quoted. The Indian Ministry of Railways, realising that the annual reports on so great a system of railways cannot normally be read by or even reach the general reader, has published this popular version. The hope is that it will help the public to appreciate the working of the system. As we have already summarised the 1956-57 annual report in our issue of June 20, it is unnecessary to review the contents of the popular edition for that year.

One Hundred Years of Permanent Way Manufacture. —Published to commemorate the centenary of Taylor Brothers (Sandiacre) Limited, of Sandiacre, near Nottingham, this 32-page booklet tells the story of the firm from its small beginning. The interest of the founder, John Taylor, in permanent way work might even be termed casual,

as on witnessing a couple of rails being prepared, for use as point-rails, in what he thought a very primitive fashion, at the Midland Railway Station at Nottingham in 1865, he felt, as an engineer, that he could do better. The booklet is well illustrated, and is an adequate record of this company's growth.

Gardner Diesel Engines.—A leaflet has been received from Norris, Henty & Gardners Limited, Barton Hall Engine Works, Patricroft, Manchester, dealing with the LW, 4LK, HLW and L3 series of diesel engines. Amongst other applications, some of these power units are suitable for locomotives and railcars.

This is Napier.—The current issue of the house journal (Vol. 1, No. 3) notes the 150th anniversary of the founding of the company of D. Napier & Son Ltd., of Acton, London. One of the articles describes the early products of the firm, which included printing and minting machinery. With the advent of the internal combustion engine resources were concentrated on developing this type of power unit for cars, boats, and later aircraft. Today, the company produces, besides gas turbines, rocket engines, and ram-jets, the Deltic two-stroke horizontally-opposed diesel engines and Napier exhaust-gas turbo-blowers, both of which find application to modern diesel locomotives.

Seventeenth International Railway Congress

Experience of Undulatory Wear of Rails

Research into its causes, and measures to avoid and eliminate it

QUESTION 9 for consideration at the International Railway Congress in Madrid this year was addressed to 33 railway administrations and replied to by 22. Only 13 of the 22 replies, however, were detailed reports able to be summarised. They came from the Indian Railway Board, Victorian Railways, Japanese National Railways, British Transport Commission, East African Railways & Harbours, Swedish State Railway Board, New Zealand Government Railways, South African Railways, Association of American Railroads, Coras Iompair Eireann, London Transport Executive, and New South Wales Government Railways. The summaries are by Mr. N. C. Vogan, Chief Civil Engineer, N.S.W.G.R.

His preliminary general summary explains that undulatory wear or corrugation in rails is universally considered to be of two main types: (a) roaring rails or washboard track; and (b) what is sometimes described as saddles. In (a) roars, the centres of the undulations are from 1 in. to 2½ in. apart, and their depths anything down to 0.015 in., whereas in type (b) the saddles are spaced at from 5 in. to 60 in. between centres and their depth may be ⅜ in. Type (a) occurs on straight track or on curves of 30-ch. or larger rad. On straights it generally appears in both rails of the same track, but on flat curves it is more marked in the low rail. The corrugation ridges are hard and polished and extend so deeply into the rail that even with heavy grinding they cannot be entirely eliminated. Grinding does, however, keep them under control. Among the reasons usually given for these corrugations are the vibration set up during the rolling of the rail and the sorbitising of it.

On the other hand, the widely-spaced type (b) corrugations usually occur on sharp curves of less than 20-ch. rad., and especially on track used by multiple-unit electric trains. The surface of the rail is hard, smooth and shiny not only on the ridges but also in the hollows. Extrusion of the metal is particularly noticeable on the outside face of the rail in the hollows. Type (b) also affects the low rail more severely in the first instance.

The majority of railways reporting consider that speed has no relationship with corrugations, but the N.S.W.G.R. administration is positive that the pitch of type (a) corrugations is smaller under traffic with higher average speed. This railway also reports that harder rails become corrugated more quickly than soft. It has also found that 0.015-in.-deep corrugations in rails removed from the track and used for relaying on 16-20-ch. curves on a single-line almost entirely disappeared after five years in the new position. On the other hand, it

was found that deep grinding followed by heat treatment did not prevent re-appearance in identical spots in the original track within three months.

There is difference of opinion between the railways consulted regarding the effect of fish-plated joints on undulatory wear. As might be expected, rails with type (b) corrugations are reported as having a higher incidence of failure than those without. The Victorian Railways had no fewer than 933 miles of rail affected by type (a) corrugations in 1955; the Swedish Railways had 13 km. According to London Transport engineers, corrugations of type (b) occur almost inevitably at and on approaches to stations where brakes are heavily applied and also on some curves where braking is unusual. Experience has shown type (a) to appear where the brakes of steam engines also are normally applied. Unlike most other replies, that from Sweden reports that the outer rail only develops corrugation and that it is elliptical in shape with the long axis in the same direction as the rail. South Africa reports that type (b) corrugations are worse on the outer rails of curves.

Only three administrations express definite opinions as to how soon undulatory wear appears after laying. In the case of type (a) these periods vary from 3 to 12 months. Type (b) however, may occur within 3 months. British Railways have observed that corrugation frequently starts at the running end of the rail, caused by the influence of the joint, but it may also begin in mid-rail.

Influence of Track Components

Section 2 of the report covers this subject. It is generally considered that neither the rolling nor straightening of the rails, nor their weight, length nor section is a contributory factor towards corrugation. Furthermore, except in so far as it reduces the number of joints, the long-welding of rails is not usually considered to reduce the tendency to corrugation. Some administrations report that rails laid on steel or concrete sleepers are less prone to corrugation than those on wooden. In South Africa a reduction in sleeper spacing appears to reduce the tendency to type (b) corrugation. The normal ballast and road-bed would seem to have little effect, though concrete formation and level crossings appear to encourage that type. On the contrary, British Railways mention certain places in the track known to induce roaring-rail corrugation, as successive supplies of rails have become corrugated when laid there. They consider this to be due to the geological formation beneath the ballast; this condition is not confirmed by other railways.

The most important of these factors are rolling stock and its construction, but only four administrations—South African, London Transport, New South Wales and Victoria—report in detail on this subject. Their replies are embodied in a six-page table with diagrams and give their practice in regard to: type of traction, type of drive and power, motors, wheel-components, and dimensions, brake-shoe materials, shock absorbers, wheel-spacing, weight-distribution, effect of loaded and empty vehicles, and ratio of non-suspended to total weight of vehicle. It is generally agreed that the growth of this wear is affected by the frequency of trains and also by humidity.

Replies provide little information regarding influence of combinations due to factors such as type of traction, drive, and axle-load, but it is generally admitted that they do play an important part in the formation of corrugations. Where braking is regularly applied, the growth of type (a) corrugation is minimised. It is found to develop more rapidly on tracks carrying lightly-loaded as compared with fully-loaded goods vehicles. Gradients do not appear to affect this corrugation. Little information is forthcoming from the replies regarding the effect of the wheel on the rail in the initial stage of undulatory wear. The general opinion is that braking decreases type (a) but increases type (b) corrugation.

Corrugated rails undoubtedly cause a variety of damage to track equipment. The vibration they set up increases looseness in rail-fastenings and -anchors, causes broken spikes and accelerates sleeper-cutting by up to 17 per cent. The replies received give little definite information regarding their effect on bridges or rolling stock, though some vibratory damage to supporting structures and breakage of unsprung components of vehicles are reported, as well as sympathetic corrugations in wheel-tyres in Victoria and India.

Rubber soleplate pads are being tried to avoid or reduce corrugation, but elastic spikes have been found to have no effect and they do break under undulatory wear. Various methods of grinding have been tried, but none has proved permanently successful. British Railways report that part re-sleepering with concrete sleepers mixed with timber has caused corrugation to disappear, but sorbitic corrugated rails relaid on concrete sleeper and rubber pads showed no change after two years.

No systematic research work has been reported, but in the U.S.A. experiments with an acetylene torch to temper the Martensitic area of the high polished spots of type (a) corrugations caused the ridges in the track to disappear.

British Transport Commission Results for 1957

Working deficit of £27.1 million on British Railways, and surplus of £23.4 million on other activities; progress with railway modernisation

THE Tenth Annual Report of the British Transport Commission published last Friday, shows a working deficit of £27.1 million for British Railways and a working surplus of £23.4 million for the remaining activities of the Commission.

At the beginning of 1957, traffic receipts, freight and passenger, of British Railways and of London Transport and the Tilling and Scottish Bus Groups were running well above expectations; this was because of the petrol and oil rationing, which lasted from December, 1956, to May, 1957. For a short time the whole accounts of the nationalised transport undertaking were almost in balance. By the end of fuel rationing in May the extra traffic had largely fallen away, and costs again went up, in wages and coal prices. The report points out that higher fares and charges, proposed to meet the increased costs, were postponed until August and September. The result was that the extra revenues derived from fuel rationing were swallowed up in extra costs before fares and charges were raised. A major item of increased expenditure was the 3 per cent increase in wages as from

November 26, 1956, converted into a 5 per cent increase from March 4, 1957, in response to claims from the three railway unions. After review, there was a general increase of about

5 per cent in the pay of all employees of the Commission who by analogy follow railway conditions.

Editorial comment on some general aspects of the report was made in our June 27 issue, in which also the working results of principal carrying activities were shown.

	Net receipts, year 1957 £ million	Better (+) or worse (-) than 1956 £ million
<i>Principal carrying activities:</i>		
British Railways (including C. & D. services) .. (def.)	27.1	-10.6
British Road Services ..	2.8	+1.0
Provincial and Scottish buses	5.0	-0.3
<i>London Transport—</i>		
Road	3.8	+1.2
Rail	1.9	-0.1
Ships	1.9	+0.1
Inland waterways (carrying) (def.)	0.2	-0.1
Total: Carrying activities (def.)	22.0	-8.8
<i>Other principal activities:</i>		
Docks, harbours & wharves	2.4	-0.1
Inland waterways (tolls, etc.) (def.)	0.4	-0.1
<i>Hotels & catering services:</i>		
Hotels	0.2	+0.2
Refreshment rooms ..	0.5	+0.1
Restaurant cars .. (def.)	0.5	—
Letting of land and buildings not in operational use	3.2	-0.1
Total: Other principal activities	5.5	+0.1
Miscellaneous activities ..	2.8	+0.5
Working deficit ..	£3.7	—£8.2

Manpower

In general, it is stated that recruitment of staff is no longer a difficult problem: "It can now often be highly selective." Of the relatively few staff who were displaced from their previous posts on the railways as a result of re-organisation and introducing new methods of working, such as the concentration of signalboxes, most were absorbed in standing vacancies. Any redundancy in future will be covered by new agreements with the trade unions. As regards technical staff, there is a need for more engineers "with imagination as well as technical competence," and greater scope for trainees than ever existed before. The standard of applicants for traffic apprenticeships was higher than in previous years. The

BRITISH TRANSPORT COMMISSION: CONSOLIDATED BALANCE SHEET AT DECEMBER 31, 1957

December 31, 1956	£	£	December 31, 1956	£	£
12,100,000	Current Liabilities		15,985,813	Current Assets:	
	Bank advances	11,300,000		Bank balances and cash	8,788,303
	Creditors and accrued expenses (including £5,450,000 due to a subsidiary company)	89,774,598	949,287	Marketable securities (market value £831,958)	792,862
80,808,714	Interest (less income tax) accrued on capital liabilities	14,819,401	68,839,577	Outstanding traffic accounts	70,835,828
12,477,529			15,264,975	Other debtors and payments in advance	17,456,127
105,386,243		115,893,999	109,417,329	Stores and materials	121,185,003
			210,456,981		219,058,123
42,478,752	Deposits			Investments in respect of British Transport Stock Redemption Fund Accounts (market value £28,943,040) ..	32,434,222
100,038,381	Staff savings banks	43,990,798	28,323,971		
142,517,133	Staff superannuation funds	106,706,237		Fixed Assets and Goodwill on bases indicated in supporting statements and notes on accounts	
		150,697,035		Interests in non-controlled undertakings	10,063,098
111,202,020	Provisions		10,104,410	Interests in subsidiary companies not engaged in the principal activities of the Commission	3,979,758
23,432,520	Retirement benefits	112,674,231		Rolling stock, vehicles, ships and plant and equipment	1,031,779,757
5,542,853	Taxation	13,227,132	3,047,548	Deduct Depreciation accrued to date	435,226,761
12,000,000	Internal insurance	5,290,353			596,552,996
152,177,393	Contingencies		953,742,931	Land, buildings, permanent way, docks, canals and other works	1,203,120,377
		131,191,716	428,713,172	Deduct Maintenance Equalisation account	238,636,683
1,443,619,442	Capital Liabilities		525,029,759		964,483,694
	British Transport Stock	1,443,758,684		Goodwill	42,134,337
	Advances under the Finance Act 1956 by Minister of Transport & Civil Aviation	101,200,000			1,617,213,883
40,000,000	Advances under the Transport (Railway Finance) Act 1957 by Minister of Transport & Civil Aviation ..	94,426,642	1,183,532,974	Discounts less Premiums on issue of British Transport Stock, less amounts written off	7,190,925
646,988	Obligations to Local Authorities ..	587,321	221,653,541	Special Account established pursuant to Section 3 of the Transport (Railway Finance) Act 1957	202,217,012
1,484,266,430		1,639,972,647	961,879,433		2,078,114,165
28,555,844	Capital Redemption Accounts ..	32,677,922	41,877,760		
			1,541,938,910		
	Net Revenue Account				
3,069,982	Surplus for years 1956 and 1957 in respect of activities other than British Railways	7,680,846	7,722,190		
			127,530,973		
1,915,973,025		2,078,114,165	1,915,973,025		

Note.—Estimated further expenditure on Capital Account authorised at December 31, 1957: £297,000,000.

BRIAN H. ROBERTSON, Chairman
J. BENSTEAD, Deputy Chairman
REGINALD WILSON, Member

CONSOLIDATED WORKING RESULTS OF PRINCIPAL ACTIVITIES OTHER THAN CARRYING

	Docks, harbours and wharves	Inland waterways: other than carrying operations	Hotels and catering				Letting of land and buildings not in operational use	Grand total
			Hotels	Refreshment rooms	Restaurant cars	Total		
Gross receipts	£ 21,657,604	£ 2,668,139	£ 7,259,610	£ 10,401,120	£ 4,246,157	£ 21,906,887	£ 6,262,386	£ 52,495,016
Working expenses (including depreciation or renewals and after equalisation of maintenance)	19,224,927	3,024,995	7,075,070	9,930,350	4,754,952	21,760,372	3,026,889	47,037,183
Net receipts	2,432,677	356,856 (deficit)	184,540	470,770	508,795 (deficit)	146,515	3,235,497	5,457,833
Year 1956								
Gross receipts	20,994,193	2,662,293	6,967,237	9,818,831	3,846,016	20,632,084	6,183,209	50,471,779
Working expenses	18,456,558	2,962,076	6,976,620	9,459,244	4,400,298	20,836,162	2,889,776	45,144,572
Net receipts	2,537,635	299,783 (deficit)	9,383 (deficit)	359,587	554,282 (deficit)	204,078 (deficit)	3,293,433	5,327,207

British Railways Productivity Council pursued its study of means to increase efficiency and productivity; certain important matters have been successfully resolved by negotiation, including the supplementary redundancy arrangements for conciliation staff and the agreement for the single manning of diesel and electric locomotives and multiple unit trains.

Steadily increasing awareness is reported of the benefits to be derived from the application of work study in several departments. The greatest progress made was in the civil engineering departments of British Railways. Other Divisions are using work study according to requirements, and most have a nucleus of staff trained in the technique.

During the year, sums totalling roughly £2,700,000 were authorised for new and improved staff amenities on British Railways. Some schemes of improvement will now have to be postponed because of the latest capital cuts.

The report discusses the traffic management organisation now in force, or

being brought into force in the Eastern, London Midland, North Eastern, and Western Regions. An outline is given of the stores and purchasing arrangements, with mention of the events leading up to the Howitt Report, which approved in principle the new purchasing policy which had already been adopted by the Commission.

Other organisational matters mentioned are the readjustment of Regional boundaries introduced early in 1958, after study during the previous year; and the changes in the organisation of the B.T.C. Police. Both have been the subject of comment in this journal. The report also refers to "Organisation and Methods." It is not intended to create an O.M. service throughout the Commission, but "the technique will be allowed to permeate all sections."

Research

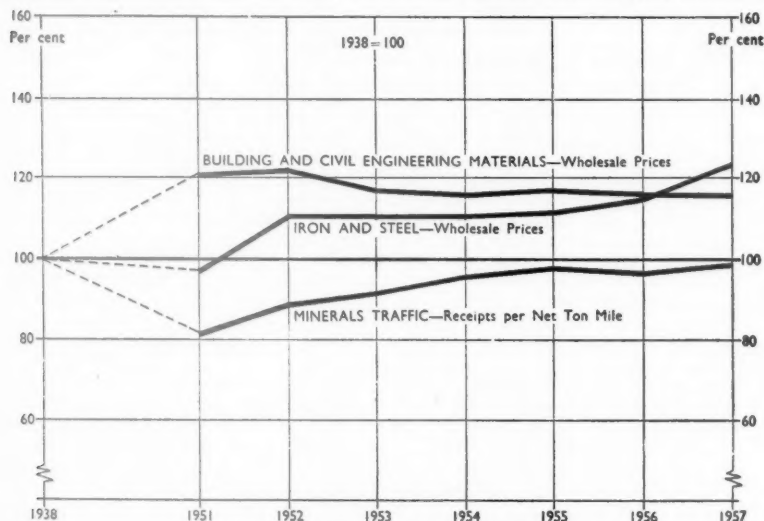
A comprehensive section on research refers inter alia to measures to improve railway techniques, including vacuum brakes, lubrication of diesels, train heating, shock-proof wagons, track and

formation, and carriage and wagon development generally. Mention is made of the customer research undertaken by the Regions.

A brief résumé is given of progress on the 50-cycle electrification in the L.M. Region between Crewe and Manchester; and in the Eastern Region on the Colchester-Clacton-Walton pilot

BRITISH RAILWAY WORKING RESULTS YEAR 1957

Year 1956	£	£
105,823,891	Gross receipts:	
6,924,777	Passenger—	
14,760,921	Ordinary	115,117,872
127,509,589	Early morning tickets	7,294,773
	Season tickets	16,486,206
		138,898,851
103,957,020	Freight (including parcels and mails)	
52,225,529	Freight train—	
126,419,566	Merchandise	105,312,735
1,466,135	Minerals	53,468,223
284,068,250	Coal & coke	128,040,481
	Livestock	1,695,541
		288,516,980
32,479,797	Passenger train—	
15,138,010	Parcels and other merchandise	34,726,276
47,617,807	Mails and parcels post	16,664,185
		51,390,461
12,891,666	C. & D. and other road freight services	13,386,316
344,577,723		353,293,757
1,207,716	Letting of sites and premises on properties in operational use (net)	1,302,078
502,691	Commercial advertising (net)	494,175
7,238,929	Miscellaneous	7,440,652
8,949,336		9,236,905
481,036,648	Total	501,429,513
175,816,565	Working expenses (after equalisation of maintenance)	
102,992,468	Train and vehicle operating expenses	186,471,304
77,231,178	Maintenance of rolling stock	110,814,484
33,836,475	Other traffic expenses	82,185,065
79,740,728	Signalling expenses	35,925,649
16,712,936	Maintenance of way and structures	84,775,787
486,330,350	General	18,181,763
		518,354,052
19,609,737	C. & D. services, trans-shipment by road vehicles and other railway road freight services	20,562,990
505,940,087		538,917,042
8,406,815	Deduct Internal charges raised for transport services	10,347,343
497,533,272	Total	528,569,699
16,496,624 (deficit)	Net receipts	27,140,186 (deficit)



Note: The wholesale price index numbers are those published by the Board of Trade. For building and civil engineering materials the old and new series are linked at 1950.

Changes in average railway charges for minerals traffic and in wholesale prices of iron and steel and of building and civil engineering materials, in terms of 1938 purchasing power

scheme. The Eastern and North Eastern Regions are stated to be preparing a report on electrification of the East Coast main line north of York. Good progress is reported on the Glasgow suburban and Great Eastern and London, Tilbury & Southend Line conversions, also on the first phase of the Southern Region Gillingham to Thanet and Dover third-rail electrification, due for completion in June, 1959.

Delivery and placing in service in 1957 of various diesel motive power units. Reference is made to the high-speed multiple-unit sets now under construction, also to single-unit railcars for lightly trafficked services, and to rail-buses.

New and reconstructed stations, marshalling yards, and terminals are mentioned briefly. Plans are started to provide for building 27 new yards and modifying 26; against these, 158 existing yards will be closed and 37 partially so.

Track and Signalling

Electrification at 50 cycles caused much civil engineer work in effecting the necessary clearances, as described in this journal. Track re-conditioning made possible faster running on several sections. Mention is made of laying long-welded rails. "Research investigation," it is stated, "has established that, provided additional sleepers and improved fastenings are used, stability of long-welded rails can be achieved with timber sleepers. Thus it will be possible to proceed with the programme pending the solution of outstanding problems associated with concrete sleeper fastenings."

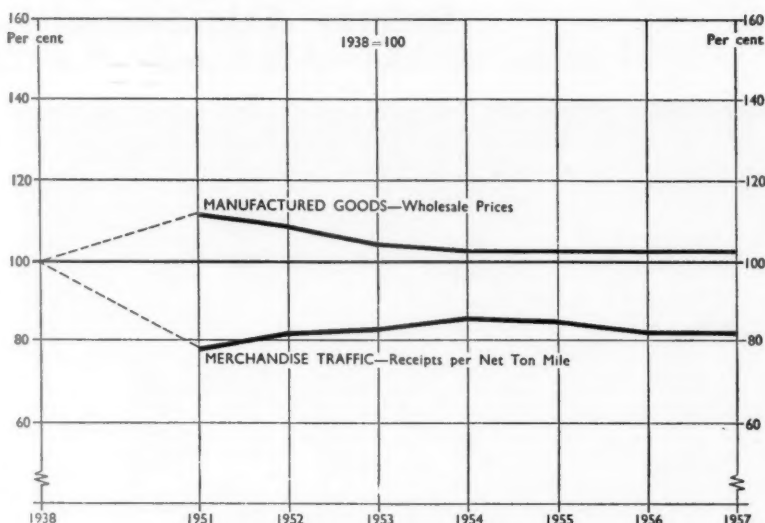
New colour-light signalling, including the replacement of semaphore signals, covered hundreds of miles of line last year. The greater part of this work related to the new electrification and marshalling yard schemes.

The Commission, after lengthy experiments over 105 route miles of line, obtained the approval of the Minister of Transport for standard A.T.C. equipment and made plans for its bulk manufacture and installation on all main lines other than those of the Western Region, which are already fitted with the G.W.R. system of A.T.C. In principle, priority must be given to routes where train frequency and speed are high, and sections still signalled with oil-lit semaphores will be tackled before those equipped with colour-light.

Carriages and Wagons

With passenger carriages, the main development in 1957 was the exhibition at Battersea, last summer, of prototypes with a view to determining design. The cuts in capital expenditure, it is stated, will largely affect locomotive-hauled vehicles rather than on railcars and multiple-unit trains. As to wagons, reference is made to vacuum-fitted hopper wagons for iron ore, to air-slide wagons for certain powders, and to covered hopper wagons for chemicals in bulk.

On the L.T.E. Underground lines,



Note: The series of index numbers published by the Board of Trade of wholesale prices of manufactures with 1938=100 has been linked at 1950 with the new wholesale price index numbers of the output of non-food manufactured products.

Changes in average charges for railway merchandise traffic and in wholesale prices of manufactured goods, in terms of 1938 purchasing power

one of the principal new works was re-tracking between South Kensington, Gloucester Road, and Kensington High Street in conjunction with the construction of the West London Air Terminal. Detailed planning of the scheme to four-track the Metropolitan Line to Watford South junction continued.

Traffic

"An outstanding and most satisfactory feature" of the year was that in aggregate passenger traffics increased, despite the growth of private motoring. British Railways passenger traffic "increased substantially." This improvement is attributed in the report very largely to accelerated introduction of diesel multiple units in replacement of steam trains. Another influence has been the speeding up of a number of existing main-line services.

The report states that "there is reason to believe that the total volume of goods available for inland transport failed to increase in 1957, and in fact may well have fallen. Industrial production, as measured by the official index, was once again on the whole stable. Some industries increased their output, notably the motor industry, but this was offset by a decline in others... which were, if anything, those whose transport requirements in tonnage terms are relatively high." With British Railways coal class traffic, the main factor affecting the total tonnage carried was the reduction in the quantity of coal available for transport. The total tonnage of coal and coke carried in 1957 was nevertheless under one per cent below that of the previous year. The railways continued to maintain their share of the steel industry traffics included in the minerals group. The

decline in mineral traffic is attributed mainly to a slackening off in building activity.

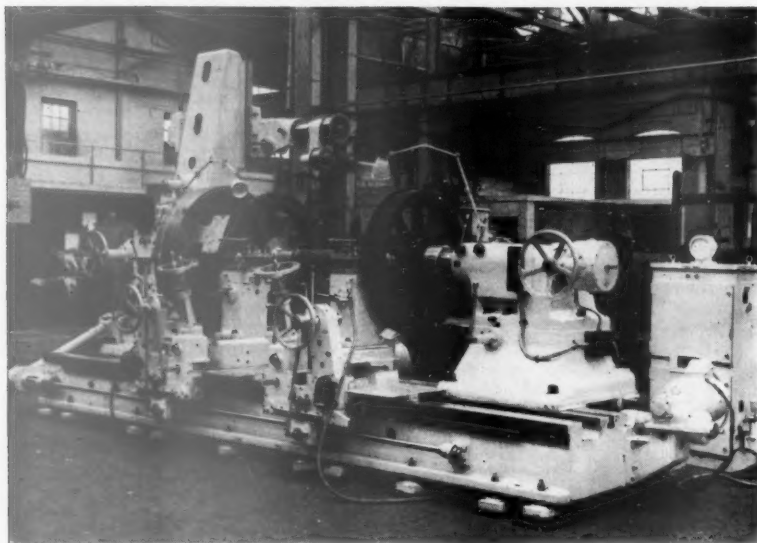
The main steps taken to improve passenger services in 1957 were the introduction—in all the Regions—of multiple-unit diesel trains (including the "inter-city" sets in Scotland) and railcars. The results in many cases have borne out the estimates made by Regional managements before the schemes were sanctioned and the rolling stock ordered. "The multiple-unit diesels are the quickest form of modernisation and the one calculated to give the quickest returns." Despite the capital cuts, the rates of delivery planned for 1958 are to be maintained as far as is possible.

The report points out that improvement of freight services takes longer. Services nevertheless are claimed to have been improved during the year. More filled freight trains were run. The programme of fitting vacuum brakes to wagons began "but is now subject to the effect of capital cuts." The punctuality record of filled trains was high. New types of vehicle and container were offered to traders.

All Regions continued with campaigns to maintain and increase traffic for which rail transport is particularly suitable. With the negotiation of new charging agreements, substantial tonnages of coal class traffic were won or retained to rail. On the other hand other hauls have been lost to road transport. "The decline in freight traffics as a whole during 1957" it is stated "should not be allowed to obscure the fact that the railways gave full satisfaction to their customers in many respects and particularly where they were able to offer a superior service."

Railway Axle Journal Lathe

For light and heavy turning in South African Railways workshops



Journal re-turning and burnishing lathe; note the belt pulley gear for outside journal turning above faceplate

AN overhead belt drive for rotation of the wheelset, with flat belt drive on to the wheel tread is claimed to be an effective method of producing a fine surface finish on axle journals. The belt centres are readily adjustable to suit varying wheel diameters and the drive offers no obstruction when loading. Such a drive has been standardised by Craven Bros. (Manchester), Ltd. In certain instances, however, heavy cutting operations are required on the inside bosses of wheels before replacement of wheel boss liners, and for this class of work the belt drive is not suitable.

The South African Railways required a lathe in which is combined the belt drive for light turning and the positive spoke-type driver from a faceplate. The machine now described is suitable for the simultaneous re-turning or burnishing of two outside journals of S.A.R. 3-ft. 6-in. gauge carriage, wagon, bogies, and tender wheelsets, and will turn or burnish, one at a time, the inside journals and wheel boss faces of locomotive wheelsets. It was produced by Craven Bros. (Manchester) Ltd., to S.A.R. specification.

Provision is also made for cutting out wheel boss liners when these have to be removed. With a 2-ft. 9-in. height of centres, the equipment will swing wheelsets up to 5 ft. 3 in. flange dia. and accommodates work from 4 ft. 0½ in. to 7 ft. 6½ in. between centres. The wheelset to be machined is supported between two live centres; one centre is built into the tailstock sliding barrel, and the other into a similar sliding barrel in the headstock. Both barrels are adjusted longitudinally by handwheels and are

securely locked in position after adjustment to support the wheelset. The headstock and tailstock both have power-operated adjustment along the bed, and are moved inwards or outwards in unison to suit different lengths of axle, and to facilitate loading.

The two saddles each have pillar-type compound slide rests with two-position tool turrets. They are mounted on the two front ways of the bed and can be

positioned for dealing with the two outside journals simultaneously, or for working at any position on the axle between the wheels for dealing with inside journals or seatings. In the latter operation only one saddle can be used, while the other saddle is moved to an inoperative position adjacent to the tailstock. Each turret carries a special turning tool holder at one position and a single-roller burnishing tool at the opposite position.

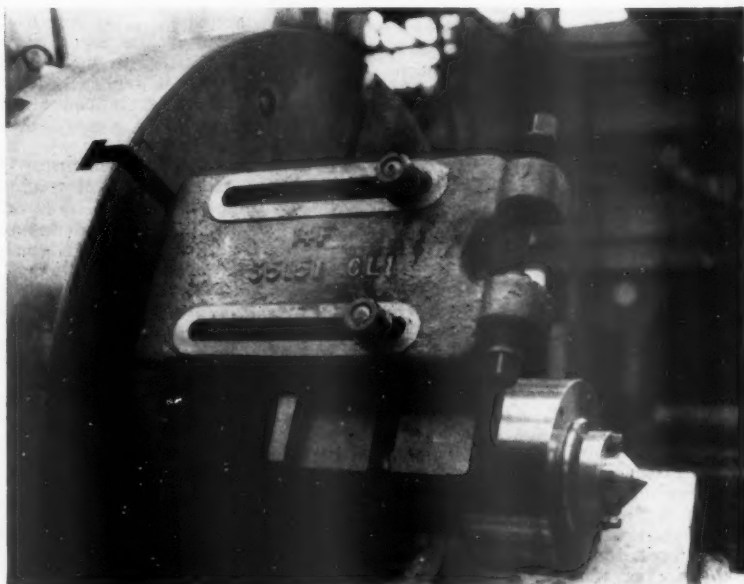
Belt Drive Arrangement

The belt drive for journal turning and burnishing consists of a flanged driving pulley and jockey pulley assembly mounted on top of the headstock. Vertical adjustment of the pulley spindle and its saddle upon a pillar bracket enables a single driving belt to be used for the full range of wheel diameters. Horizontal adjustment of the pulley spindle in its saddle allows for varying lengths of axle journal and for setting the belt to suit wheelsets with either inside or outside journals. The drive is conveyed from the main headstock gearing to the pulley through bevel gearing and vertical and horizontal shafts.

For heavy cutting the wheelset is rotated by a spoke driver attached to the faceplate. This is mounted on ball bearings and carried on a fixed sleeve extending over the headstock. Drive is from the headstock gearing through an external pinion in engagement with a spur ring on the back of the faceplate.

The faceplate has tee-slots to which are attached two adjustable driving brackets fitted with set-screws to grip

(Continued on page 19)



External gear-driven faceplate driver to grip wheel spokes for heavy turning

ELECTRIC RAILWAY TRACTION SECTION

Train Performance Calculators

THE installation of an analogue computer in the Chief Electrical Engineer's Office, British Railways Central Staff, at Marylebone, reported in our June 20 issue, is one example of the application of computing equipment in a less familiar sphere. Calculations of train performance from data of locomotive characteristics, train resistance, and gradients are fundamental work which consumes considerable time. The advantage of obtaining a result in two minutes which would take about half-an-hour to reach by conventional methods needs no emphasis at a period when large electric and diesel-electric traction projects in many parts of the world submit technical staff to a pressure which could be relieved otherwise only by an improbable increase in their numbers. The type of computer in question was developed at the Manchester College of Technology, and was described in a paper presented to the Measurement and Utilisation Sections of the Institution of Electrical Engineers in London on April 15 by Professor E. Bradshaw and Mr. F. Cooke of that college, and Mr. W. Wagstaff, who was formerly at the college and is now on the staff of Ferranti Limited. We recently had the opportunity to see equipment of this type in operation in the Traction Department of the General Electric Co. Ltd., at Witton, where its use in conjunction with the network analyser described in our June 6 issue affords facilities for the whole range of investigations involved in traction projects.

The signals which actuate the performance calculator are derived from curve followers "reading" charts of locomotive characteristics and train resistance curves, and from a punched tape record of gradients expressed in binary code form. From these inputs curves of speed are plotted against bases of distance and time, with a current-time curve if required. Provision is made also for recording energy consumption and dissipation in the motor circuit, derived from a curve follower reading the motor current curve. The operator simulates braking and coasting by manipulating switches at the appropriate moments as observed by watching the progress of the recording pen on the speed/distance chart. Various modifications of the prototype have been incorporated in the calculator at Witton, among which are the automatic over-riding of tractive effort when the braking switch is operated, and the increase of tractive resistance by an appropriate figure when coasting is simulated. A switch control has also been evolved for changing from one locomotive characteristic to another while the machine is running, giving the effect of a driver operating his controller. It has been found practicable to use the same gradient tape for runs in both directions over a route by slight modifications to the method of punching and the provision of an additional switch on the machine. If the calculator has to be stopped while plotting a run, the gradient relays drop out, but they can be reset from switches on the front panel when plotting is resumed.

The calculator is understood to have predicted speeds in many cases within 1 m.p.h. of the actual figure when plotting performance curves before the trial runs of the first of the North British-G.E.C. Type "1" diesel-electric locomotives. On the occasion of our visit it was being used in connection with the traction equipments which the G.E.C. is supplying for 71 multiple-unit sets to operate on the Liverpool Street - Chingford - Enfield - Hertford-Bishop's Stortford 50-cycle electrification. The need for devices of this kind is shown by the ingenuity devoted in the past to devising methods for reaching similar results. Examples of these have been described in this journal from time to time. A mechanical device for producing run curves, but obtaining data from prepared templates, was the subject of an article in our issue of November 22, 1957. The versatility of the computer enables train per-

formance calculations involving a wide range of data to be carried out in a minimum of time; but it must be emphasised that calculators are in no sense a substitute for the experience required in making the first selection of suitable characteristics for a specific duty. By greatly facilitating the investigation of different possibilities, however, they help to ensure that specification requirements are met in the most satisfactory manner possible.

Opportunity for British Enterprise

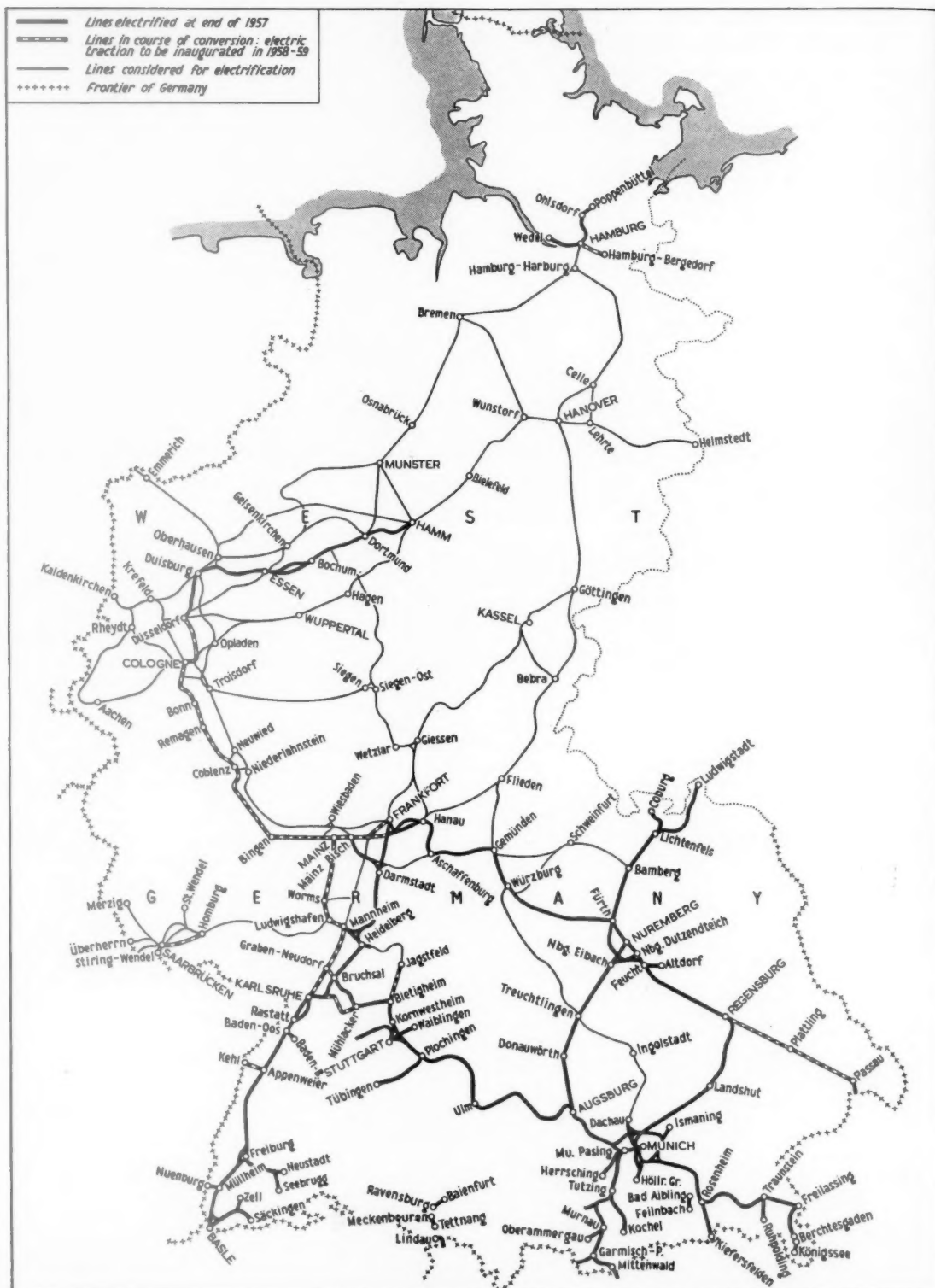
MANAGEMENTS of railways in some of the less developed countries in Asia and Africa have been quick to see the advantages of a.c. electrification. A major attraction is the ability to increase capacity without resorting to doubling; but conditions in parts of India and elsewhere sometimes approximate to those on heavily trafficked lines serving industrial districts in North Eastern France, where 50-cycle traction was first applied on a large scale. A.C. electrification is very much in the air.

Because it requires locomotives and other equipment of a type hitherto unfamiliar, and staff with specialised knowledge to operate and maintain them, the railways to which it is applicable afford good potential markets. The way in which French industry, with some associated firms in other countries, has been able to supply the Indian railways with 50-cycle equipment, in conjunction with the loan of the services of French National Railways staff, is well known. French industry and the S.N.C.F. were accepted as the exponents *par excellence* of a.c. electrification. But the cradle of 50-cycle electrification was the Höllental line in South Germany, converted in 1935. How far, but for the war, the German railways and German industry would have pursued its development is problematical. At all events, after the war it was the French occupational authorities who took the initiative, studied the techniques, including those relating to rectifiers, and France introduced a.c. traction to the world.

There is nothing to prevent any industrialised country from profiting in this way. In Japan there is enough a.c. electrified mileage to afford valuable experience, which is being used in supplying material for the 50-cycle conversions in India. Russia is developing its own 50-cycle practice, though it is impossible to ascertain to what extent locomotives, apart from some supplied from France, and feeder equipment are Russian-made. It is not unlikely that industry in the U.S.S.R. before long will offer equipment and technical help to countries considering a.c. railway electrification. Of potential markets China probably is the largest.

British Railways so far have had little to show in a.c. electrified mileage despite progress made in converting the Crewe-Manchester and other lines. On the other hand, notably in overcoming difficulties occasioned by a restricted loading gauge in relation to clearances—of great importance to some metre and narrow-gauge railways—they have unique knowledge, besides profiting by experience abroad. Their technical staff are more than busy on these and other problems, whereas the S.N.C.F. has been fortunate in commanding the services of a good many engineers whose services it has been possible to make available in an advisory and supervisory capacity in India—the result of recruiting, after the war, a large staff for rehabilitation work. Before long, however, the number of British railway engineers with a.c. experience will have grown. The demands of British Railways are important—but so, in the national interest, are those of the British export industries. Is it possible to hope for an arrangement which would enable the railways and the industry of this country, and railways overseas, to take advantage of British knowledge and skill in somewhat the same manner as is being done by the French railways and their associates?

Development of Electric Traction in Germany



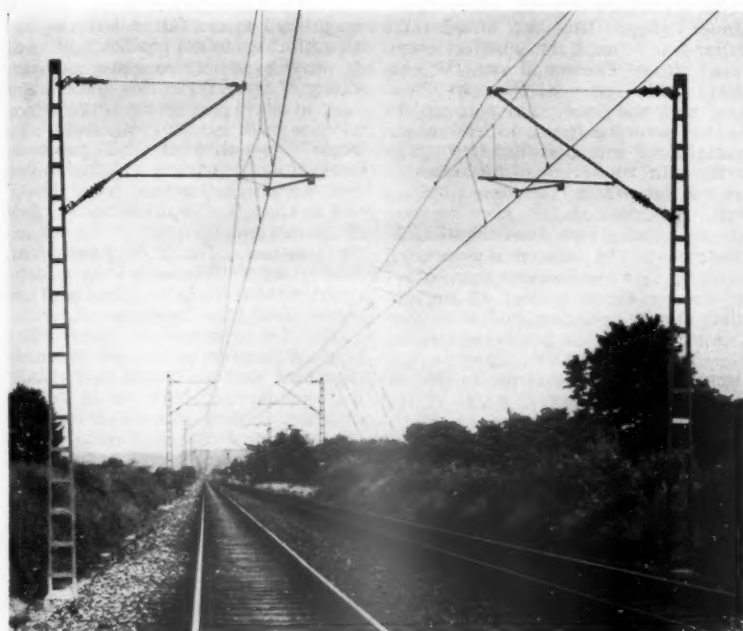
German Federal Railway, showing lines electrified at the end of 1957, and those in course of conversion

Development of Electric Traction in Germany

Standardisation of locomotive types

By Ministerialrat A. Peters

Vice President, Munich Division, German Federal Railway



Catenary and contact wire supports and supplementary "Y" form cable

AT the end of the war the West German railway authorities were left with an electrically operated route mileage of 1,600 km. (994 miles). Of these sections 55.6 km. (just over 34 miles) were being operated at 20,000 V., 50 cycles a.c. (Höllental line, from Freiburg-im-Breisgau to Neustadt in the Black Forest and Seebrugg). There were also 34.8 km. (some 22

miles) operated partly at 1,200 V. d.c. and partly at 6,600 V., 25 cycles a.c. (Hamburg "S-Bahn"), 21.4 km. (13½ miles) from 550 to 700 V. d.c., while the greater part of the system was being worked on the German standard method, 15,000 V., 16½ cycles a.c.

Although conditions in the post-war years made it difficult to proceed with further electrification, nevertheless the

need to modernise and, above all, rationalise the working made it essential to take the work in hand, and a commencement was made in 1949 in the Stuttgart area. The first sections dealt with were individual lengths in the South German network on which a change of traction was felt to be necessary on both traffic and economic grounds. Not until a few years later, however, was the German Federal Railway in a position, with the understanding financial support of the provincial authorities in the various districts, or Länder, to enter on a comprehensive electrification programme, aimed at an agreed objective.

A thorough investigation of the conditions obtaining on a section of route contemplated for the initial stage in the programme, where the traffic was very heavy, indicated that only by electrification would it be possible to increase its carrying capacity economically. Moreover, this showed that the system of traction hitherto in use, 15,000 V., 16½ cycles a.c., was technically the best for further electrification, both as being the most economic and also the best adapted to future heavy traffic demands.

There was a considerable increase in 1957, when no less than 465 km. (some 289 miles) of new electrified sections were brought into service. With the opening of the one from Aschaffenburg to Frankfurt (Main) on January 15, 1958, the total electrified route mileage was raised to 2,684 km. (1,668 miles), or about 8.7 per cent of the Federal Railway's lines. About 770 km. (478 miles) are in course of conversion and will be completed in 1958 and

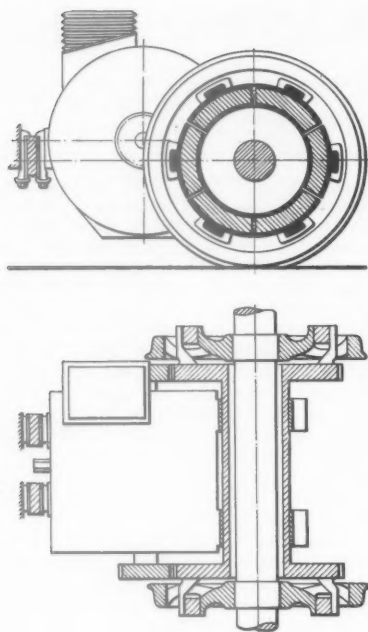
Type	Axle (or wheel) arrangement	Total weight	Axle loading	Weight of electrical portion	Weight of mechanical portion	Hourly rating at 70 per cent maximum V.	Rating		Maximum speed, k.p.h.	Number of vehicles on order	Number of vehicles delivered
							At 90 per cent of the maximum transformer no-load voltage	At a speed of k.p.h.			
E 16 ^(a)	Bo—Bo	tonnes 85	tonnes 21.25	tonnes 43.5	tonnes 41.5	3,240	3,700	120 (75 m.p.h.)	150 (93 m.p.h.)	115	40
E 40	Bo—Bo	83	20.75	42	41	2,968	3,700	87.6 (54 m.p.h.)	100 (62 m.p.h.)	162	53
E 41	Bo—Bo	66	16.5	34	32	2,200	2,400	97.8 (61 m.p.h.)	120 (75 m.p.h.)	120	44
E 50	Co—Co	128 (a) 125 (b)	21.3 20.8	60 57	68.0 68.0	4,302	4,500	80 (50 m.p.h.)	100 (62 m.p.h.)	41	34
ET 30	(Bo—2) + (2—2) + (2—Bo)	164 (c)	19.8	35	112	1,760	2,080	120 (75 m.p.h.)	120 (75 m.p.h.)	24	24
Double frequency locomotive	Bo—Bo	~32	~20.5	~42	~40	~2,600 at 65 k.p.h. (40 m.p.h.)	—	—	120 (75 m.p.h.)	3	—

(a) Locomotive with flexible rubber ring drive

(b) Locomotive with nose suspended motors

(c) With all seats occupied

Characteristics of four classes of a.c. locomotive and one three-coach set (ET30)



Side elevation and plan of rubber ring flexible drive

1959; this will bring the route mileage up to 3,454 km. (2,146 miles), or 11.1 per cent. The joining up of lines in the Ruhr with those in South Germany, intended to be effected in 1959, will mean that electric working will be continuous from the southern end of Italy

or the south-east frontier of Austria up to that area of North West Germany.

Further large projects under consideration include the section along the right bank of the Rhine from Frankfurt (Main). This, with the section along the left bank, to be completed throughout by the beginning of 1959, forms the principal traffic artery of the Rhine Valley. This also includes the sections in the Ruhr district northwards from Dortmund via Wanne-Eickel and Gelsenkirchen to Duisburg, with the connection between the sections now being electrified around Saarbrücken and Ludwigshafen. The north-south connection from Gemünden via Bebra and Hanover to the sea ports is also under consideration because of the very heavy traffic encountered. The electrically-operated Hamburg City line has also been extended since 1945; at present 42 km. (26 miles) are in operation and a further 18.5 km. (11½ miles) are being converted. The old 6,600-V., 25-cycle a.c. system was replaced entirely in 1955 in favour of d.c. working.

Rolling Stock

The construction programme for a.c. locomotives and motor coaches comprises at present 441 locomotives and 24 train sets; of the former, 175 and all the latter have been delivered. Twenty-one three-unit d.c. train sets are being built for the Hamburg City line.

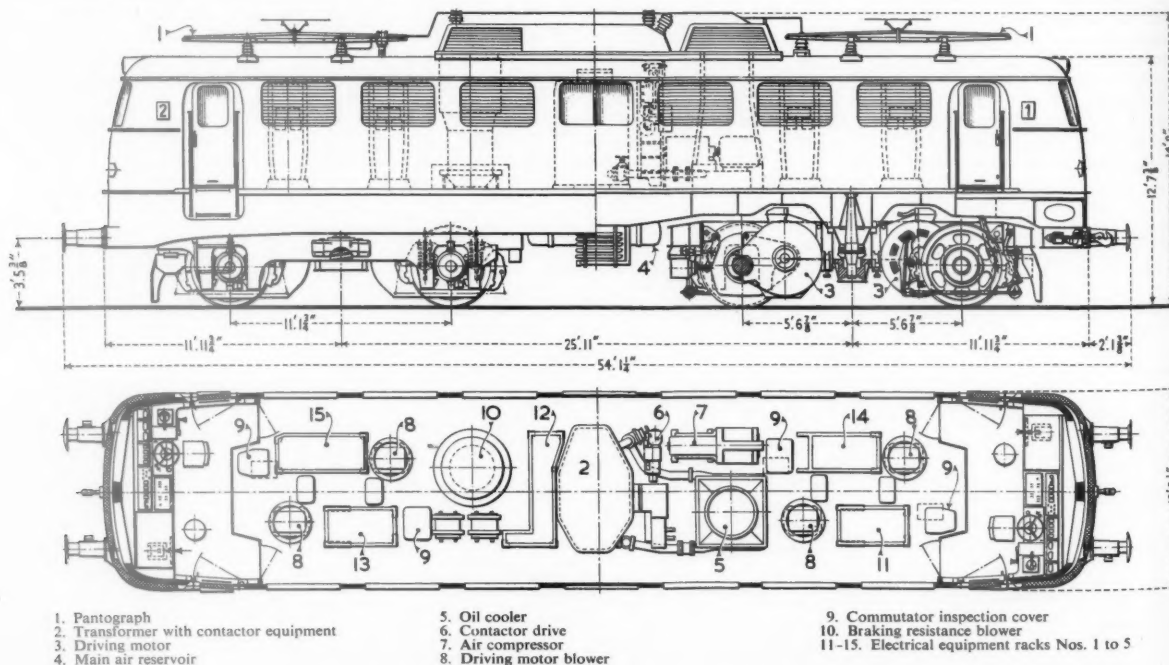
In the table on page 17, the a.c. units are set out with some of the important characteristics; four locomotive and one motor coach designs are worked out. All are of bogie type, including the E 10¹ express locomotive;

maximum speed 150 km.p.h. (93 m.p.h.) and an hourly rating of 3,240 kW. at 70 per cent of maximum speed. In 1943 it proved possible, as it did also in Switzerland, to bring into the space available between the wheels—with a 1,250-mm. (4-ft. 1½-in.) wheel diameter—a motor of such a capacity as to allow the stipulated axle load of 20 tonnes to be utilised to the full in attaining tractive effort up to the top limits of speed. It proved possible to house an hourly rating of 800 kW. in this space, and in turn made it practicable to build locomotives with no carrying axles. The bogie locomotive of high power for heavy tractive efforts and high speeds thus became a practical possibility.

The class E 40 is a derivative of the E 10¹, so that in reality there are only three classes. The E 40, however, has been given a different gear ratio, for a speed of 100 km.p.h. (62 m.p.h.) and serves chiefly for freight work.

The development of three uniform types of locomotive brought the advantage, both electrically and mechanically, that standardised parts could be used extensively; their value reaching about 35 per cent of the purchase price of a locomotive.

The question of specifying an optimum tractive effort characteristic was investigated. In addition to selecting the best form for the motors themselves, special attention was directed to the control equipment and the drive to the axles. Classes E 10¹/40 and E 50 locomotives have the control on the high voltage primary side of the transformer but for the E 41, where starting currents are sufficiently low, the cheaper low tension regulation was adopted.



1. Pantograph
2. Transformer with contactor equipment
3. Driving motor
4. Main air reservoir

5. Oil cooler
6. Contactor drive
7. Air compressor
8. Driving motor blower

9. Commutator inspection cover
10. Braking resistance blower
- 11-15. Electrical equipment racks Nos. 1 to 5

Elevation and plan of class E 10¹ Bo-Bo electric locomotive

In all cases there are 28 notches. With the exception of 25 Class E 50 locomotives, which have nose suspended motors, all will have a rubber ring flexible drive. The spring support on one side of the easing, however, gives the design some resemblance to nose suspension, but instead of resting on the other side on the axle, it embraces it by a hollow spindle and through this engages the rubber driving element. In this way any accelerative forces bearing on the motor itself are only about a fourth or a fifth of those met with under ordinary nose suspension. Classes E 10¹ and E 50 have d.c. rheostatic braking.

The running gear, which is identical in all three classes, carries the draw gear and buffing equipment on the head stock, and has lateral spring supports, pre-loaded pivot pins for restoring it to normal, and horizontal sliding surfaces and coil springs to support the axles and slide elements. The low placed pivot pin in addition to guiding transmits the tractive effort to the headstock. The wheel and axle assemblies are accurately guided. For this purpose the axlebox assemblies have top and bottom hardened pins running in cylindrical guides: these, through the intermedium of heavy silentblobs, are carried above in the bogie frames, and below in the axle-fork web. All axleboxes are arranged on standard lines as single row hung roller bearings.

The stock of a.c. motive power units at the end of 1959 will, with the delivery of those now on order, total 958 locomotives and 122 motor coaches, or train sets.

Fifty-cycle Operation

Two new motive power units have been delivered since 1945 for the Höllental line, the 50-cycle system trial section. They are a Bo-Bo locomotive and a Bo 2 + 2 Bo train set; both with single-phase commutator motors, arranged in tandem on the locomotive. The 50-cycle stock now consists of five locomotives and the train set. No further items are contemplated. On the other hand three double-frequency locomotives are on order to run on either 50 or 16 $\frac{2}{3}$ cycles, for use on this line or for through working to the French National Railways. All three will be Bo-Bo rectifier locomotives.

Two are to have silicon rectifiers which, as they have a high back voltage, a low weight, are compact, and are very simple and unaffected by temperature changes, are specially suitable for such service.

Power for the railway is generated in steam or hydro-electric stations at 16 $\frac{2}{3}$ cycles by special generators and transmitted at 110,000 V. to sub-stations along the lines. These generating stations serve also to provide 50-cycle three-phase current for general purposes, making a common use of the hydraulic or thermal resources available. In addition some 50-cycle power is taken from the public network and transformed to 16 $\frac{2}{3}$ cycles by converters. As these also feed into the high voltage mains, and the frequency relationship between public and railway mains is not absolutely rigid, these converters are built as variable groups with subsidiary machines to take over the slip load. The two latest sets at Cologne and Karlsruhe, the largest of the kind yet built, have a capacity of 31.25 MVA at 500 r.p.m.

In the thermal stations, current for the railways is either generated in special turbo sets or more recently in coupled units, able to generate both forms of current, of which there are two types. The first, called steam coupled, consists of a first turbine driving a three-phase generator and a second one, in tandem, driving both a three-phase and a single-phase generator (Düsseldorf municipal station) the second type has a single-phase and a three-phase machine driven by one turbine, known as mechanical coupling (Mannheim station); a hydraulic clutch or coupling between turbine and single-phase generator provides for the taking up of any frequency difference between the two power networks.

Railway power consumption for 1957 amounted to about 1,000 million kWh. At the opening of that year about 251,000 kW. generating capacity was available, and this was increased in the 12 months by some 43,000; a further 50,000 will be added during 1958. What is as yet the largest turbo-generator set for the railway has now been ordered, 34,000 kW. capacity. A feature of considerable importance in the working is the paralleling of the

power stations of the German and Austrian Federal, and German and Swiss Federal Railways. This allows one supply network to aid the other and provides a mutual exchange of power resources.

The sub-stations are built as half open-air type. Each has two outdoor 10-MVA transformers, and the main transmission feed has both its loops brought into the station. In 1957 sub-stations were opened at Karlsruhe, Aschaffenburg, Gemünden, Weierstadt (near Darmstadt), Duisburg, and Dortmund. Others are under construction at Flörsheim, Bingen, Koblenz Remagen, Gremberghoven (near Cologne) and Plattling.

Standardised Overhead Equipment

A characteristic of the German Federal overhead construction is the keeping under tension of the carrier cable and the contact wire; the carrying of the equipment on tubular brackets with freedom to swing, and with "Y" form supplementary cable; and the use of short side supports on supporting tubes, as a safeguard against wind effects.

The contact wire has a cross-section of 100 sq. mm. (0.155 sq. in.), and the bronze catenary cable 50 sq. mm. (0.077 sq. in.). This standard equipment is suitable for speeds up to 160 km.p.h. (nearly 100 m.p.h.) and at any temperature. On the open line between stations up and down contact wire equipment is supported in separate structures. In the Ruhr district special attention has been paid to the possible effects of impure atmosphere or damage arising from subsidence due to mining activities.

The overhead control cut-out switches in the stations have been hitherto operated by traffic staff on the orders of the sub-station attendants, but on recently electrified sections the switches are remotely controlled from the sub-stations. The remote control desk carries a graphical representation of the circuits, on which any dead section is shown by illuminated indicators. Should any fault develop in the overhead equipment then the attendant can see at once what the position is and take steps to deal with it in consultation with the stations concerned.

Railway Axle Journal Lathe

(Concluded from page 14)

the wheel spokes. Alternatively a pin type driver can be used for solid disc type wheels.

Main Drive Mechanism

The main drive to the machine is by a 10-h.p. constant speed motor, mounted on a hinged bracket at the rear of the headstock, and vee belts. A friction clutch in the headstock for starting and stopping is operated by duplicate hand-

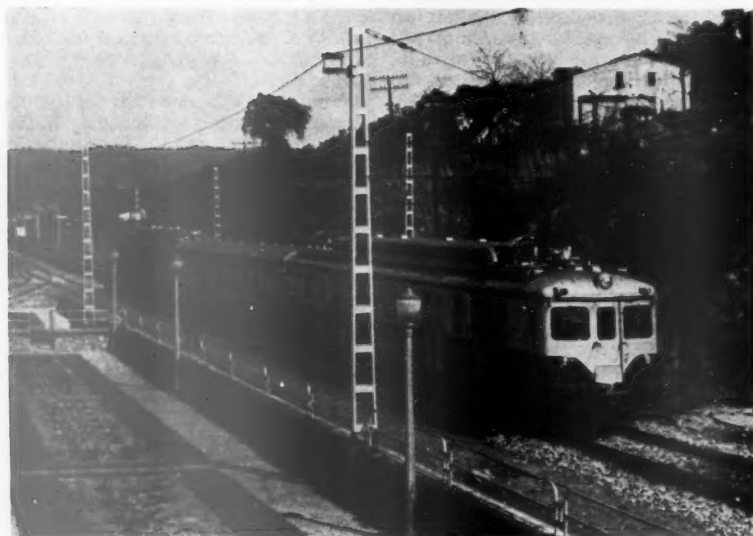
levers, one on the front of the headstock and the other on the tailstock. Lever-operated gearing in the headstock gives twelve speed changes, while a further lever selects the belt drive or the faceplate drive. The belt drive gives work speeds from 3.1 to 68 r.p.m. when driving a 3-ft. dia. wheel. The speed range of the faceplate drive is from 2.7 to 59 r.p.m.

Four feed gear changes are housed in the headstock, the drive being taken by shafts and gears to a feed shaft along the front of the bed, thence through

sliding gears in the two saddles to pinions engaging a rack in the bed. Handwheels on each saddle provide longitudinal and transverse adjustment, and separate levers engage sliding or surfacing motions and feed reversing gears. Adjustable feed trips automatically limit the longitudinal traverse. An electrically-operated lift of the screw-jack type, situated in the centre of the bed, provides for raising the wheelsets up to the machine centre height after running into position from the rear of the machine on rails fitted to the bed.

Extension of Electrification Around Barcelona

Conversion to the 3,000-V. d.c. system of a further suburban route



Multiple-unit three-coach train set for suburban services at Massanet-Massanas Station

THE Spanish National Railways have recently put electric services in operation between Barcelona Término and Massanet-Massanas (known formerly as Empalme) via Granollers, a distance of 43 miles, of which some 20 miles are double line. This completes the conversion on the 3,000-V. d.c. system of the so-called "Catalan Eight," with extensions via Tarragona, and via Roda to Mora la Nueva. The entire scheme covers 113 miles of double and 144 miles of single line, with additional tracks in stations.

Work on the route between Barcelona and Massanet-Massanas via Mataró has also been completed, but pending the delivery of sufficient 3,000-V. rolling stock, now on order, is being operated as far as Arenys de Mar on the 1,500-V. system inaugurated in 1929. When enough stock has been obtained a very frequent service will be provided on all the lines. It is intended to change the other lower voltage lines in the neighbourhood to 3,000-V. working as opportunity serves.

Power Supply

The contact line is of the type adopted as standard for the 3,000-V. lines, with two wires, each of 107 sq. mm. (0.17 sq. in.) cross section, suspended from a cable, also of copper, of 153 sq. mm. (0.24 sq. in.) and carried for the most part by side brackets on openwork steel masts with span wire construction in stations. Power is taken from a sub-station at Massanet-Massanas, itself fed at 25 kV, three-phase; 50 cycles, from the Catalan Electric Supply Corpora-

tion, but the section can also be supplied from the Vilanova sub-station at Barcelona, capable of feeding not only routes previously in service but the new one as well. At Massanet-Massanas there is a 2,000-kW. air-cooled mercury arc rectifier set, capable of carrying 50 per cent overload for two hr. and 200 per cent for five min. There is space for additional equipment of like capacity to meet future requirements. When the section from the junction at Moncada to S. Juan de las Abadesas, electrified in 1929, is also converted to 3,000 V. it will be possible to take power from the Las Franquesas sub-station, but for the time being, should necessity

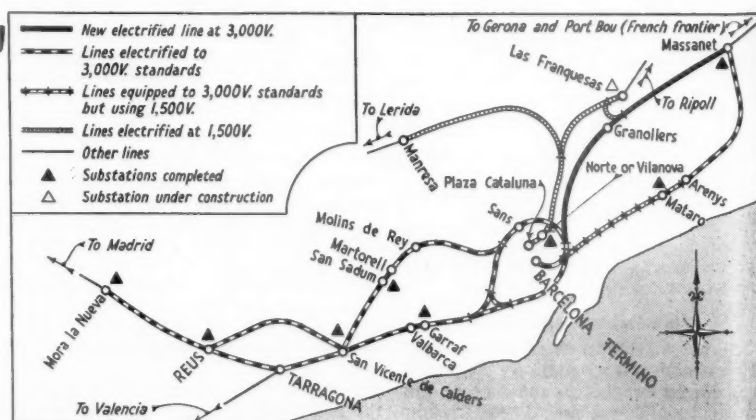
arise, a 2,000-kW. mobile sub-station can be used.

As in the rest of this area, ordinary through passenger and freight trains will be worked by Co-Co type locomotives, class 7600, of 3,000 h.p. continuous rating and 120 tonnes adhesion. Each locomotive has six totally suspended motors working through a Sécheron type drive, in various electrical combinations, with field weakening control. Air brakes operate in conjunction with vacuum on the train, although either can be applied separately if desired, with regenerative braking in addition. There are at present 42 locomotives for the 3,000-V. routes in the area; 20 were supplied by Alstom and 22 by Spanish builders, and 38 are on order in Spain.

Multiple-Unit Stock

For local services 48 three-coach train sets, each consisting of a motor coach at each end with trailer between, fitted with Scharfenberg all-purpose couplings, have been ordered; 15 in Switzerland and the rest in Spain. Four of the Swiss sets have been delivered. Each seats 260 passengers and can carry up to 650.

The motor coaches have four suspended type motors, of 258 kW. hourly and 220 kW. continuous rating, also with Sécheron drive, coupled permanently in series in groups of two, themselves connected in series or parallel, with field shunting facilities. These arrangements give a continuous rating of about 2,100 h.p. at the wheel treads for a complete train set. Maximum speed is 120 k.p.h. (75 m.p.h.). Both Knorr type air and rheostatic braking are provided. The electro-pneumatic control circuits are fed at 65 V. The motor coaches weigh 58 tonnes and the trailers some 31 tonnes.



R.E.N.F.E. electrification in the Barcelona area, showing new electrified line

RAILWAY NEWS SECTION

PERSONAL

Mr. J. Ratter, Technical Adviser to the British Transport Commission has been appointed a full-time Member of the Commission. He succeeds Sir Landale Train who retires on September 30. The following appointments are also renewed: Sir John Benstead, Deputy Chairman; Lord Rushholme and Sir Reginald Holmes Wilson as full-time Members.

British Railways, the organisation in the Hull and York Traffic Manager's area is being revised. The Commercial and Operating Districts at both Hull and York will cease to function separately and will be combined under a District Traffic Superintendent at each place. Mr. C. Hearnshaw, District Operating Superintendent Hull, has been appointed District Traffic Superintendent Hull and Mr. C. Birch, District Operating Superintendent York,

Dr. Llewellyn Douglas, Chief Mechanical Engineer, South African Railways, who, as recorded in our June 6 issue has been appointed Assistant General Manager (Technical) of that system, joined the South African Railways in 1925 as a pupil mechanical engineer at Uitenhage. In 1935 after serving at Bloemfontein and Pretoria, he was transferred to Usakos, South West Africa, and became Locomotive Superintendent Pretoria, in 1937. He



Mr. L. C. Grubb
Assistant General Manager (Technical),
South African Railways, 1954-58



Dr. Llewellyn Douglas
Appointed Assistant General Manager (Technical),
South African Railways

Mr. L. C. Grubb, who, as recorded in our June 6 issue, is retiring as Assistant General Manager (Technical), South African Railways, was born in 1898. He joined the South African Railways as a Pupil Mechanical Engineer at Pretoria in 1924, and was appointed Research & Test Engineer in 1937. He became Chief Superintendent (Motive Power), Johannesburg, in 1942. After serving as Mechanical Engineer, in charge of new mechanical workshops planning in 1945, Mr. Grubb was appointed Assistant Chief Mechanical Engineer (Motive Power) in 1946. He became Chief Mechanical Engineer in 1949, and Assistant General Manager (Technical) on January 28, 1954.

Mr. H. F. P. Plumridge, General Manager, Ghana Railway & Harbours Administration, is on leave in the U.K.

As a further step in the combination of the Operating and Commercial departments of the North Eastern Region of

has been appointed District Traffic Superintendent York.

The late Sir James Milne, former General Manager of the Great Western Railway, who died on April 1, left £80,859 (£76,663 net; £33,823 duty paid).

Mr. D. S. Thomson, Vice-President, Canadian Pacific Railway, and Dr. G. Earle Wight, Chief of Medical Services, Canadian Pacific Railway, have been promoted in the Order of St. John of Jerusalem to the rank of Commander Brother.

Mr. M. Ganapati, General Manager, Western Railway of India, has been appointed Resident Director of the Rourkela Steel Project, under the Ministry of Steel, Mines & Fuel.

We regret to record the death, on June 29, of Mr. J. C. Jones, General Manager of the Paraguay Central Railway.

was appointed Mechanical Engineer, Uitenhage, in 1939, and Advisory Engineer, Washington, U.S.A., in 1943. He transferred to London in 1945 returning to South Africa later as the engineer for workshops layout. In 1948, Dr. Douglas was appointed Assistant Chief Mechanical Engineer (Workshops), Pretoria and became Chief Mechanical Engineer (Pretoria), in 1954.

We regret to record the death on June 25, at the age of 63, of Sir Gurney Braithwaite, Parliamentary Secretary to the Ministry of Transport & Civil Aviation from 1951 to 1953.

To mark the retirement after 50 years of service of Mr. F. W. Goring, Stationmaster, Kings Cross, Eastern Region, British Railways, H.E. Mr. Per Prebensen, the Norwegian Ambassador, presented him with the Sank Olav's Medalien in recognition of his services to the Norwegian tourist industry.



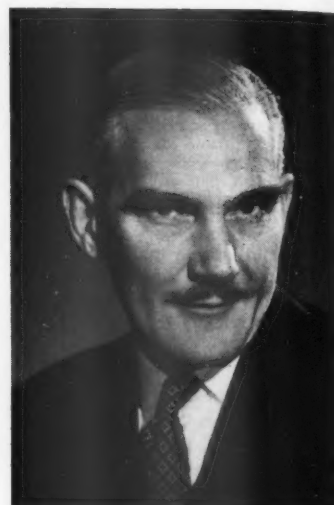
Mr. H. Carter

New Works Engineer, London Transport Executive, 1938-58



Mr. H. G. Follenfant

Appointed New Works Engineer, London Transport Executive



Mr. A. C. Edrich

Appointed Civil Engineer (Maintenance) London Transport Executive

Mr. H. Carter, M.C., A.M.I.C.E., M.I.Struct.E., New Works Engineer, London Transport Executive, who, as recorded in our June 27 issue, has retired, is 63. He began his career in the Civil Engineering Department, London Electric Railway in 1920, after serving in the Army from 1914 to 1919. He was awarded the Military Cross while in France with the Royal West Surrey Regiment. Shortly after joining the railway, Mr. Carter supervised the lining of the Bakerloo Line tunnels under the Thames with steel sheeting, as a reinforcement against possible flooding. He took charge of the building department in 1928, and was appointed an officer in 1934. In 1938 he became New Works Engineer, but was recalled to the Army at the start of the 1939-45 war. He served in France with the British Expeditionary Force in the Royal Engineers and took part in the evacuation from Dunkirk. He returned to London Transport after the war and has been responsible for much of the preparatory planning for the projected Victoria Line from Victoria to Walthamstow.

Sir William Stanier has been elected President of the Production Engineering Research Association. Sir Lionel Kearns has been elected Chairman of Council.

The London Midland Region of British Railways announces the following appointments:—

Mr. W. G. F. Thorley as Assistant Motive Power Officer (Utilisation), Euston.

Mr. A. G. Minty as Line Traffic Officer (Motive Power), Crewe.

Mr. A. S. R. Crome as Assistant to Accountant, Euston.

Mr. M. A. Henstock as Assistant Supplies & Contracts Manager, Euston.

Mr. J. McGuigan as Assistant (Supplies), Supplies & Contracts Manager's Office, Euston.

Mr. N. Thornley as Assistant (Work Contracts), Supplies & Contracts Manager's Office, Euston.

The appointment of Mr. A. B. Macleod, Stores Superintendent, London Midland Region, has been redesignated as Supplies & Contracts Manager.

Mr. H. G. Follenfant, O.B.E., T.D., B.Sc.(Eng.), M.I.C.E., A.M.Inst.T., who, as recorded in our June 27 issue, has been appointed New Works Engineer, London Transport, is 49. He was employed by London Transport and its predecessors from 1929 until 1948, when he left the New Works Engineer's office to take up an appointment in the Colonial Engineering Service in East Africa. In 1953 he was appointed General Manager of Railways, North Borneo. During the war, Mr. Follenfant served with the British Expeditionary Force in the Mediterranean and subsequently at 21st Army Group Headquarters in Europe, and was Deputy Director of Transportation, British Army of the Rhine. He became Assistant Civil Engineer (Permanent Way), in 1956.

Mr. A. C. Edrich, A.M.I.C.E., who, as recorded in our June 27 issue, has been appointed Civil Engineer (Maintenance), London Transport, is 47. He joined the Metropolitan District Railway in 1930 as a special entrant apprentice at Lillie Bridge and, in 1934, became an engineering cadet. By 1938 he was Liaison Assistant for engineering work on the Bakerloo Line, in connection with the 1935-40 New Work's Programme. In 1944 he became Senior Assistant to the Permanent Way Engineer (Railways) and in 1951 was made Permanent Way Engineer (Railways). Mr. Edrich became Assistant Civil Engineer (Permanent Way) in 1953 and Assistant Civil Engineer (General) in 1956.

Mr. C. E. Dunton, Chief Civil Engineer, London Transport Executive, who, as recorded last week, is President Elect of the Permanent Way Institution, will take office on January 31, 1959.

WESTERN RAILWAY OF INDIA

The Western Railway of India announces the following appointments:—

Deputy General Manager (General) Mr. S. S. Khan.

Deputy General Manager (Personnel) Mr. M. R. Sanjana.

Divisional Superintendents: Mr. R. N. Chaudharie (Bombay), Mr. C. L. Kapur (Baroda), Mr. V. S. Sathe (Rajkot), Mr. E. S. Muthukrishna (Ratlam), Mr. B. M.

Kaul (Kotah), Mr. I. C. Bahree (Ajmer), Mr. K. R. R. Aiyangar (Jaipur), Mr. H. K. D. Capoor (Bhavnagar).

Financial Adviser & Chief Accounts Officer: Mr. S. G. Pothan, Deputy Chief Accounts Officer: Mr. T. Adishes Iyer (Ajmer), Deputy Financial Adviser: Mr. M. N. Dutta, Deputy Chief Accounts Officer (G): Mr. G. D. Tere, Deputy Chief Accounts Officer (Survey & Construction): Mr. G. M. Gidwani.

Chief Operating Superintendent: Mr. D. R. Khanna, Chief Commercial Superintendent: Mr. D. D. Sethna, Deputy Chief Commercial Superintendent (Claims): Mr. V. J. Daftary, Deputy Chief Commercial Superintendent (General): Mr. V. R. Kewalramani, Deputy Chief Operating Superintendent (Coaching): Mr. B. N. Wahal, Deputy Chief Operating Superintendent (Goods): Mr. S. C. Chatterjee, Road Superintendent: Mr. J. E. Castellino.

Chief Engineer: Mr. G. Y. Mangrulkar, Engineer-in-Chief: Mr. M. B. Patel, Deputy Chief Engineers: Mr. M. J. Patel (South), Mr. N. K. Hazra (Centre), Mr. P. N. Zutshi (North), Mr. Hari Sinha (West), Mr. T. R. Vachha (Bridges), Mr. A. C. De (S. & C.), Mr. Raja Prasad (S. & C.), Mr. V. Giridharadas (Special).

Chief Mechanical Engineer: Mr. J. F. Muncherjee, Deputy Chief Mechanical Engineer (Workshops): Mr. R. M. Patel (Ajmer), Deputy Chief Mechanical Engineer (W): Mr. S. R. Woodmore, Deputy Chief Mechanical Engineer (L): Mr. S. N. Mathur, Deputy Chief Mechanical Engineer (C. & W.): Mr. K. M. Aiana.

Deputy Chief Operating Superintendent (Power): Mr. C. H. Sadarangani.

Chief Electrical Engineer: Mr. S. C. B. Mazumdar, Deputy Chief Electrical Engineer: Mr. S. P. Tonse.

Chief Signals & Telecommunications Engineer: Mr. G. R. Pathak, Deputy Chief Signals & Telecommunications Engineer: Mr. P. R. Mullan.

Controller of Stores: Mr. D. R. Robinson, Deputy Controller of Stores (Planning): Mr. D. V. Phatarpekar, Deputy Controller of Stores (G): Mr. F. J. Vachha.

Chief Medical Officer: Dr. F. B. Khambatta.

Chief Railway Security Officer: Mr. N. V. Reddy.

Indian State Railways Annual Dinner

Progress in India and Pakistan: Indian railways as pioneers of modern practice and standards

The annual reunion and dinner of the officers of the Indian State Railways (India and Pakistan) were held at the Rembrandt Rooms, London, S.W.7, on June 27. The reunion was attended by many officers and their ladies.

Sir Robert Marriott took the chair at dinner. Proposing the Loyal Toast, he read the text of a telegram to the Queen conveying the loyal greetings of officers of the Indian railways and that of Her Majesty's gracious reply. He then named those officers who had passed away since the last reunion:

N.W.R.: Messrs. J. C. Highet, P. H. Mafin, R. H. Paterson,
M&S.M.R.: Mr. G. A. Salter,
O&T.R.: Messrs. G. M. S. Smith, J. A. Smith.

S.I.R.: Messrs. G. H. Newton, W. R. Oaten, C. A. White.

Mr. T. T. Lambe, formerly Deputy Chief Mechanical Engineer (Works & Maintenance), East Indian Railway, and now a partner of Messrs. Rendel Palmer & Tritton, proposed the toast of the railways of India and Pakistan.

The most interesting recent railway development in the Republic of India, he said, was the electrification of the former E.I.R. between Calcutta and Bandel; the first electric train ran on December 1, 1957. Under the second five-year plan 800 miles of line were to be electrified.

Between 1929 and 1947, he pointed out, there was a period of depression, followed by war, during which the railways were mainly occupied with making do with what was available rather than a period of vast expansion.

Nevertheless, during the first 70 years of Indian Railways mileage increased at the rate of about 600 miles a year. It was no detriment to the initiative, competence, and foresightedness of the present railway managements, in India, under whom expansion had been very considerable, to record that the oldest members present that evening, and their predecessors, also had done a great deal for India.

Increase in Traffic

On the traffic side there had been a steady increase in passengers amounting to 18 million a year during the first 20 years of this century, say 1½ million passengers a day by 1947. Since Partition this figure had leapt ahead and was now 3½ million. Freight, which had reached 90 million tons a year by the 1920's, was now 125 million, and continually increasing. Coal traffic had increased by 50 per cent since Partition and was now 38 million tons a year. Mangane and iron ore production had increased from 2-8 to 5-7 million tons.

The port of Calcutta was taking a good proportion of coal and ore exports and had mechanical handling plant capable of handling 500 tons of coal an hour. There were difficulties of draft in the River Hooghly and it was understood that consideration was being given to a deep-water port on the right bank nearer its mouth.

As to locomotives, although the emphasis was on electrification, there were 47 diesel shunters and 20 broad-gauge and 20 metre-gauge main line locomotives in service and 119 on order from the U.S.A.

In Pakistan the emphasis had been on rehabilitation. Under a five-year plan starting in 1955, 70 crores of rupees were to be spent, of which 56 related to rehabili-

itation of locomotives and rolling stock. Freight traffic has increased by 50 per cent during the last 10 years.

Pakistan having no coal resources of its own, the emphasis had been on diesel traction. The Pakistan railways had 120 broad-gauge and 51 metre-gauge diesels, with an excellent record for availability.

Vacuum-Fitted Wagons

Vacuum fitting, Mr. Lambe continued, had been standard for many years in India for freight trains. On British Railways it was only now being considered under the modernisation plan.

Indian standard open and covered wagons had been coming forward in greater and greater numbers over the last 30 years with but little alteration and were probably one of the most successful examples of railway standardisation in the world.

India was now thinking in terms of bogie wagons with centre-buffer couplers, air brakes, and 20-ton axleloads for coal and ore traffic.

Indo-Pakistan Traffic

Interchange between Pakistan and India had its ups and downs and now averaged four trains a day on the broad- and one train a day on the metre-gauge. The international traffic wagons were specially marked. The efforts of the interchange staff resulted in the wagon stock in India being probably some of the best maintained in the world.

India and Pakistan, Mr. Lambe concluded, must learn to live together. The railways formed a link which would serve to bring those two great countries closer together.

Sir Robert Marriott expressed the thanks of all concerned to Mr. Lambe. He also thanked Sir Leonard Wilson for continuing to act as President of the Committee, and Mr. Norman Calder for his excellent work as Secretary.

Those present at the dinner were:

Bengal Assam: Messrs. J. H. Bavin, R. W. Bagley, G. S. Bocquet, N. D. Calder, H. D. Creedy, H. A. Joscelyne, V. A. Khan, T. McIntyre, F. E. Musgrave, M. A. Plunkett, L. V. Pont, H. M. Read, A. E. Smaller, A. T. Stephens,

Bombay, Baroda & Central India: Messrs. J. P. Bardsley, J. S. Bearcroft, L. G. Bigg-Wither, W. Blake, K. Cantlie, R. T. Collins, C. G. Cotesworth, H. R. Eveleigh, G. P. M. Fitzgerald, E. Gardner, J. N. A. James, G. de P. Leeper, K. T. Lomas, H. L. McHugh, J. W. Maye, P. D. Mitton, W. J. Moore, A. B. Rogers, H. C. Sarin, G. T. Simpson, J. S. Tritton,

Bengal Nagpur: Messrs. W. J. Coode, H. V. Corks, P. F. Dennison, W. E. C. Greenham, P. R. Leigh-Bennett, W. K. Orton, R. V. Sandes, H. F. Simpson, A. K. Southern, A. F. Tabraham, D. C. W. Tonkin,

East Indian: Messrs. J. M. Agabeg, G. W. Browne, C. N. Burns, J. M. Fenton, J. C. Gibson, R. A. Goodman, R. C. Harvey, E. H. B. Heysham, T. T. Lambe, Sir Robert Marriott, Messrs. L. T. Madnani, F. G. S. Martin, R. S. Oakley, A. B. Turner,

Great Indian Peninsula: Messrs. S. Barber, H. H. C. Barton, A. J. Bayross, C. M. Cock, E. L. Ensor, A. J. Frazer, D. H. Ferguson, A. G. T. Glaisby, R. J. Harris, L. A. Hoyle, S. N. Hussain, L. S. Johnson, S. Marchant, J. B. Remington, Dr. R. H. Rishworth, Messrs.

C. H. H. Robertson, C. I. Routh, Sir Leonard Wilson, Messrs. L. M. D. Wrench, E. S. Woolridge,

Madras & Southern Mahratta: Sir Godfrey Armstrong, Messrs. S. M. Anwyl, G. S. Baldrey, W. Cathrow, V. J. Crow, A. M. Dent, J. S. Fiddes, W. G. Latham, R. de K. Maynard, G. W. Molle, Dr. H. J. More, Messrs. P. Morris, E. Perfect, A. C. Read, B. A. Spencer, H. W. L. Stevens, B. J. Tapner, D. O. Thomas,

North Western: Messrs. L. G. Asquith, A. R. Barber, P. S. A. Berrige, E. A. Blackwood, A. C. Brabson, E. V. Coello, A. F. Coello, G. A. Dyke, W. E. Gelson, Colonel R. E. Gordon, Messrs. H. H. Green, Sir A. Griffin, Messrs. F. C. Griffith, A. G. Hall, H. W. Huggins, Colonel D. McMullen, Messrs. B. Moody, J. W. Ogle, A. O. Roberts, A. M. Sims, Colonel E. C. S. Stowell, Messrs. W. G. Stephens, H. Sparrow, G. M. Tappin, E. B. N. Taylor, R. O. C. Thomson, N. C. Watney, J. Wyse,

Oudh & Tirhut: Messrs. P. S. Bennett, W. D. Craig, J. V. Elson, H. E. Hypher, C. L. Jacobs, D. A. McAlpine, W. Miller, K. K. Polwhele, R. D. B. Robathan, G. A. Rowlerson, H. C. W. Westwood,

South Indian: Messrs. F. Ashmore, G. Collingwood, A. R. Edington, C. E. Gayes, H. C. Hodgson, J. Hutcheson, C. R. Martingell, E. La V. Parisot, P. G. C. Peyton, V. R. Riley, Colonel L. S. Sanson, Messrs. H. E. Thompson, A. Vieyra, R. D. Walter, J. F. Wright, C. J. Wooldridge.

Exhibits at Institution of Civil Engineers Conversazione

Models and other exhibits shown at the conversazione held by the Institution of Civil Engineers at Great George Street, London, S.W.1, on June 26 include a railway signalling automatic junction working programme machine. This was exhibited by Mr. C. E. Dunton, Chief Civil Engineer, London Transport Executive.

The machine was described in an issue of December 13, 1957. It is controlled by information received direct from the working timetable in the form of a punched travelling band made from Melinex sheet, the holes in which give complete information as to the destination, route, and, if necessary, other characteristics of each underground train for the entire 24-hr. period.

Contact springs, which become operative electronically when opposite holes in the band, which itself moves forward step by step with the passage of the trains, act appropriately through relays on the signalling controls and as set up the correct route and clear the relevant signals for the train to which the record refers at a given moment. If nothing occurs to make it necessary to interfere with the timetable order, the operation of a junction is effected entirely automatically from the machine.

British Railways, Western Region

Mr. M. R. G. Smith, Chief Civil Engineer, Western Region, British Railways, exhibited three models. The first demonstrated a method of measuring and recording slowly alternating movements, the second showed the principles and applications of a quickest method of mechanically pointing brickwork, and the third showed the principles and application of a direct method of locating slip planes in slopes.

A display illustrating the production of interesting surface finishes on concrete by means of pre-formed plastic sheeting was presented by Mr. A. R. Collins, Technical Director, Cement & Concrete Association.

NEW EQUIPMENT AND PROCESSES



Truck-Mounted Crane

THE M.E.II truck-mounted 8-ton capacity crane has been designed for general contracting applications. It is available with boom lengths from 25 to 65 ft. with maximum loads varying from 8 to 3.61 tons with these lengths.

The crane carrier is a six-wheel chassis, the frame of which is fabricated from rolled steel joists. The side members are 16 in. x 6 in., and outriggers are fitted at front and rear. Jacking boxes and beams are built-in, the beams extending to a maximum of 11 ft.

The engine, a Ford 6D 100-b.h.p. diesel, drives through a semi-centrifugal 12-in. dia. clutch to the four-speed and reverse main gearbox and the two-speed transfer gearbox. Front wheel drive is available as an optional extra. The forward control cab is a one-man type, of all-steel

construction. A fully-adjustable driving seat is fitted.

The crane machinery, located in the upper superstructure, is driven by a Ford 4D, 40-h.p. diesel engine. Engine transmission is by single-plate clutch and Layrub coupling to a two-speed gearbox. The main transmission is by 1-in. duplex chain, totally enclosed and running in oil. The derrick unit is of the worm-drive type with grooved drum and automatic brake. The turntable is of the live roller ring type with three hook rollers; the circular turret has an internal gear rack welded on to the crane carrier.

Full details may be obtained from the manufacturer, Thomas Smith & Sons (Rodley) Ltd., Crane & Excavator Works, Rodley, Leeds.

Auto-Repeat Facility for Horizontal Miller

THE Archdale 20-in. horizontal milling machine, code 14670, is now available with a single or a repeating-automatic table cycle.

With the existing design, it is necessary for the operator to maintain the quick table movements by pulling outwards on the control lever, and also to reverse table direction by the same lever.

The alternative allows one or more cycles up to a maximum of 20 to be performed with the minimum of attendance. The operator starts the spindle and table by push buttons and can then leave the machine to continue to the end of its cycle or cycles, at which point both spindle and table will come to rest.

The cycle operates as follows:— The operator presses the start button, the spindle revolves and the table is approached to a point just clear of the work at the rate of 150 in. per min. A dog on the table switches off the quick traverse motor, the feed continuing at the previously selected rate. On comple-

tion of the feed traverse, a dog causes the table to reverse accurately at feed rate, immediately after which quick return is engaged to bring the table back at the fast speed. In a single cycle, this speed is maintained until the table is stopped automatically at the loading position. Where a repeating cycle has been arranged, quick return is changed to feed just before reversal, to reduce shock; after this the table proceeds in quick forward and the sequence described above continues until the requisite number of passes have been made. The spindle and table then stop automatically. The number of passes is predetermined by gearing built into a housing alongside the control box.

The spindle runs throughout the period of operation stopping only when the table stops. A square, normally concealed by a cover is provided to manipulate the table reverse clutch, enabling the table to be wound along by hand for setting.

Suitable automatic indexing fixtures would enable one operator to attend to two or more machines, it is stated.

Further details may be obtained from the manufacturer, James Archdale & Co. Ltd., Blackpole Works, Worcester.

Assistance with Choice of Welding Filters

AIDS to assist firms concerned with welding to choose the correct types of protective filter glasses for their operatives, are cards and wallets containing samples of seven Protex glasses for electric welding and eight Protal and Protex glasses for gas welding with and without flux. They all conform to British Standard Specifications.

With their use it is easy to decide which filter is the most suitable for a particular job, by trying out a selection under working conditions.

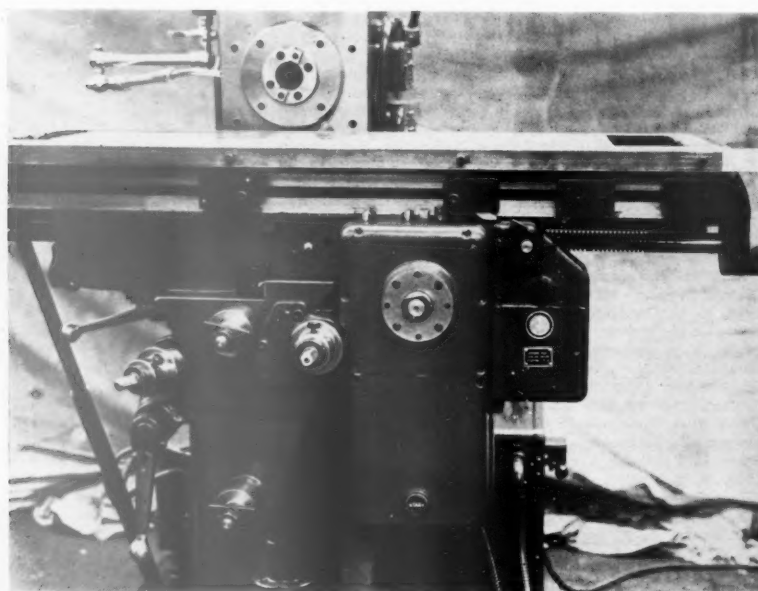
The cards and wallets are available free on application to suppliers of welding protection equipment. They have been developed by Chance Bros. Ltd., Smethwick, Birmingham, which company manufactures glass for this purpose.

Non-Selective Weedkiller

LIQUID Monobor Chlorate, a non-selective weedkiller now available in this country, is claimed to be an advance over previous mixtures of sodium chlorate and inert fire retardants, both as regards to safety and weedkilling effects. It is a combination of sodium chlorate and sodium borate in liquid concentrate form, in which the fire risk normally associated with chlorate weedkillers is suppressed by the borates which are themselves potent weedkillers.

It is stated to be used widely on U.S.A. railways, where it has displaced sodium chlorate/calcium chloride mixtures for track maintenance. Monobor Chlorate is a combination of sodium borate and sodium chlorate, and the extra herbicidal properties afforded by the borate makes the product, it is claimed, a more efficient and thus a more economical weedkiller.

Application costs are low as it can be diluted with water and applied with conventional spraying equipment. The recommended rate of application is $\frac{1}{2}$ gal. of the concentrate to 100 sq. yd. This quantity



will have to be increased to eradicate well established weeds and grasses. In most conditions, the heavier the rate of application, the longer the period of control. It is officially approved by the Ministry of Agriculture and by the Department of Agriculture for Scotland.

It is available in drums containing 5, 10 or 20 gal. and further details may be obtained from the manufacturer, Borax Consolidated Limited, Borax House, Carlisle Place, London, S.W.1.

Drum and Crate Handling Equipment

THREE items of Conveyancer-Lande equipment for handling drums and crates are now being manufactured in this country, under licence. These are the Skidtruck, a device for handling cases, the Drumtruck, for drums or tubs either closed or open, and the Handtruck for drums and crates.

The Skidtruck can handle loads up to a maximum of 1,763 lb. and can deal with crates which are flat on the ground. By manipulating the towing handles a steel tongue can be made to slide under the end of the crate after which it is lifted and the



truck pushed under the crate. It is then locked on the crate, after which it can be moved at will, and off-loaded quite easily. The maximum length of load which can be handled is around 58 in.

The Drumtruck, which can deal with a wide range of drum sizes and types, is fitted with automatic gripping devices which assist the handling operation. The unit is operated by pushing it towards the drum barrel or tub to be handled until the automatic grippers are in position at the widest part of the drum. By lifting the truck to withdraw the support wheels, the grippers lock onto the barrel which may then be moved as required. The barrel is discharged by lowering to the ground and releasing the grippers by a release handle.

The truck can be used for barrel diam. of 18½-26½ in. and heights of 25½-39½ in. It has a maximum lifting capacity of 1,102 lb.

The third piece of equipment, the Handtruck, is designed for moving containers of various shapes, up to a weight of 1,100 lb. This has two small ramps upon which the load is transported and a changeable clamp which locates on the top of the crate or drum, locking it against the truck. Beside the two main carrying wheels a smaller castor wheel is fitted to assist manoeuvrability. The upper and lower accompany-



ing illustrations show the Drumtruck and Handtruck respectively.

Further details of this range of equipment may be obtained from Conveyancer Fork Trucks Limited, Warrington, Lancs.

Crack Detection Apparatus

DESIGNED originally for the production testing of diesel engine connecting rods, an addition to the manufacturer's range of portable crack detection apparatus is a machine giving a current flow up to 1,200 A. It produces a magnetic flux up to 750 oersteds through a 2-in. air gap.

This model, designed as a compact high output bench machine for the rapid production testing of small- to medium-sized components, will take articles up to 16 in. long. Additional accessories such as long cables with heavy bronze clamps widen its field of application still further; an alternative type of stand with motor driven circulating pump, ink tank and piping is also available.

A 5-kVA. transformer is fitted and all components are conservatively rated. It

has a cast, ribbed aluminium base on which all parts are mounted with the exception of the meter, controls and indicating dial lights, which show which system is in use. The size of the machine is 20 in. square, and the bench model is 15 in. high. A console model is also available which is 4 ft. in height.

Further details can be obtained from Radalloyd Limited, Glen Road, Oadby, Leicester.

Valve Voltmeter

A VALVE voltmeter to measure d.c. and a.c. circuits without bleeding the circuit under test has been designed. The instrument presents a very high impedance to the circuit under test.

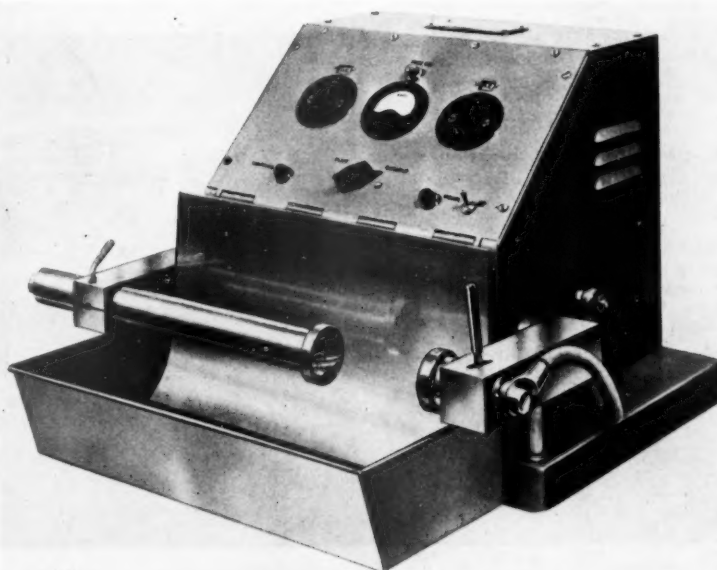
In most instruments, part of the circuit is tied down to one side of the chassis; this is undesirable under some circumstances. This unit is housed consequently in a glassfibre-reinforced-plastic case, the insulation of which is better than 100 MΩ. The circuit, therefore, "floats" above earth; the case itself is also stated to be robust.

The instrument is claimed to be very stable, to possess complete freedom from drift, and to require no recalibration during use. The a.c. probe uses modern silicon junction diodes. The meter scale which is 5 in. long, is fitted with a mirror; it may also be used as a centre zero reading valve voltmeter, claimed to be a unique feature.

The voltmeter is essentially a centre zero reading device with facility for a left-hand side dial zero for a.c. and \pm d.c. measurements. The mains input is 110 V. and/or 200 V., a.c. 50-60 cycles per second. It is stabilised against \pm 10 per cent variation in mains voltage. Capacity of the negative terminal to earth is 200 pF. approx.

The range of the instrument in balanced d.c. position (centre zero) is: ± 2.5 , ± 7.5 , ± 25 , ± 75 , ± 250 , and ± 750 V.; the range in a.c. position covers 5, 15, 50, and 150 V.

The price is £48 10s. Further details may be obtained from Winston Electronics Limited, Shepperton, Middlesex.



British Railways 1958 Rolling Stock Building Programme

In the British Transport Commission schedules for the construction of locomotives, carriages and wagons for 1958, a total of 553 locomotives of all types, are planned to be placed in service during this year. Diesels total 484.

Of these, 373 are to be built in British Railways workshops of which 6 are to be electric, 63 steam and the remainder diesel. The steam locomotives are all Class "9" standard 2-10-0 freight locomotives; the electric locomotives, Southern Region d.c. main-line type. The analysis of the diesel locomotive construction is as follows:—

BRITISH RAILWAYS WORKSHOPS

Quantity	Type	Works
37	B.R. Standard 0-6-0 350-h.p. diesel-electric shunter	Crews
81	" "	Derby
15	" "	Horwich
68	" "	Darlington
27	" "	Doncaster
32	0-6-0 200-h.p. diesel mechanical shunter	Swindon
18	" "	Doncaster
13	2,000-h.p. main-line diesel-hydraulic type "4"	Swindon
3	2,300-h.p. main-line diesel-electric type "4"	Derby
10	1,160-h.p. main-line diesel-electric type "2"	Derby
304		

CONTRACTORS

Quantity	Type	Builders
10	2,000-h.p. main-line diesel-electric type "4"	English Electric
5	2,000-h.p. main-line diesel-hydraulic type "4"	North British
20	1,200-h.p. main-line diesel-electric type "2"	Metro-vick
8	1,100-h.p. main line-diesel-electric type "2"	English Electric
15	1,160-h.p. main-line diesel-electric type "2"	Birmingham
17	1,250-h.p. main-line diesel-electric type "2"	Brush
10	1,000-h.p. main-line diesel-electric type "2"	North British
6	1,000-h.p. main-line diesel-hydraulic type "2"	North British
1	1,160-h.p. main-line diesel-electric type "2"	Birmingham
4	1,000-h.p. main-line diesel-electric type "1"	English Electric
9	800-h.p. main-line diesel-electric type "1"	B.T.H.
10	800-h.p. main-line diesel-electric type "1"	North British
11	0-4-0 300-h.p. diesel-hydraulic shunter	North British
8	0-6-0 200-h.p. diesel-mechanical shunter	Drewry Car
13	" "	Hunslet
8	0-4-0 200-h.p. diesel-mechanical shunter	Andrew Barclay
25	0-4-0 200-h.p. diesel-hydraulic shunter	North British
180		

Details as to the construction of passenger and freight rolling stock in British Railways workshops and by contractors are shown in the accompanying tables.

DIESEL AND DIESEL-ELECTRIC VEHICLES AUTHORISED

	Mechanical transmission	Diesel-electric	Total
Built up to end of 1957	1,225	102	1,327
Expected in 1958	1,090	80	1,170
Remaining for delivery in 1959	939	—	939
Total	3,254	182	3,436

PASSENGER AND FREIGHT VEHICLES SCHEDULED FOR CONSTRUCTION IN 1958

Passenger Carriages			Non-passenger Coaching Stock	Wagons	Containers	To be built at
Locomotive-hauled	Multiple-unit diesel	Multiple-unit electric				
—	256	—	—	3,100	—	Derby
228	—	—	17	2,000	730	Wolverton
28	—	60	59	—	2,780	Earlestown
104	—	100	—	—	—	Doncaster
—	—	—	—	2,850	—	York
30	127	—	—	2,300	550	Shildon
—	80*	275	104	1,150	530	Faverdale
—	—	—	—	—	—	Swindon
—	—	—	—	2,100	—	Eastleigh
—	—	—	70	100	—	Ashford
—	—	—	—	—	—	Lancing
—	—	—	—	—	490	Cowairs
—	—	—	—	—	—	St. Rollox
390	463	435	250	13,600	5,080	Total Railway Workshops
240	707	—	450	27,400	3,820	Contractors
630	1,170	435	700	41,000	8,900	—

* Diesel-electric

The "Artevelde", a New Car-Ferry on the Dover-Ostend Route

Meeting an increasing demand for motor-car traffic to the Continent

A new car-ferry, the *Artevelde*, of 1,242 net registered tons (2,778 tons gross) was brought into service on the Dover-Ostend route by the Belgian Marine Administration on June 1. The principal features of the new vessel are:—Overall length 383 ft. 3 in., breadth (without fenders) 49 ft. 2 in., maximum draught 12 ft. 9½ in., displacement at normal draught 3,145 tons, total garage surface area 18,158 sq. ft., number of passengers 1,000, number of vehicles 160 motor-cars and about 7 coaches or trailers. The ship is fitted with automatic rolling stabilisers.

Deck Arrangement

There are five decks. On "A" deck there are two de-luxe passenger cabins, the radio office, and six cabins each for two passengers. On "B" deck there is a restaurant, seating 156 persons and a bar-verandah joined by glass-panelled "Pullman Decks." Decks "C" and "D" are garage

accommodation, and "E" deck is fitted with two ladies' and two gentlemen's saloons. These saloons are fitted with 124 berths, which may be used free of charge. The temperature and the humidity of all passenger accommodation is automatically controlled.

Garage Accommodation

The two car-decks are linked by a ramp, which lifts and folds into two parts when the upper garage is full. This operation, controlled by hydro-electric gear, takes only a few seconds. Each garage has a 13 ft. 1½ in. turntable, to facilitate the handling of larger cars. Drivers handle their own cars, under the crew's instructions. Special precautions against fire are taken, the garages are partitioned by fire-proof curtains. There are usual fire-fighting appliances. Representatives of the Press were shown the ship in operation on June 24, when they were enter-



Car-decks on the m.v. "Artevelde", showing the folding ramp in the centre

tained on board during a regular crossing. That evening a dinner and reception was held at the Hotel Palace de Thermes, Ostend, Mr. G. Bertrand, General Manager, Belgian Marine Administration, acted as host, and among those present were:—Mr. E. Krier, Marine Manager, Mr. R. E. Van Craeynest, Civil Engineer at Ostend; Mr. A. A. Kesteloot, Operating Manager, Ostend, and Mr. A. Dury, representative in London of the Belgian Railways & Marine. The Southern Region of British Railways was represented by:—Mr. A. G. Baldwin, Road Ferry Assistant, and Mr. M. A. Jackson, Press Officer.

Sailing Times

The *Arvelde* leaves Dover daily at 11.15 a.m. and arrives at Ostend at 3 p.m.; it returns from Ostend at 12.45 a.m., arriving Dover at 4.30 a.m. It runs in conjunction with the *Princess Josephine-Charlotte* which departs Dover at 1 a.m., arriving at Ostend at 4.45 a.m., returning from there at 1.15 p.m., reaching Dover at 5 p.m.

High Speed in Italy

Some of the fastest schedules in the history of Italian railways have been introduced in the summer timetable. These are mainly with the first class only *elettrotreni*, or streamline electric sets. Of these the fastest are the super-luxury "Settebello" from Milan to Rome and the "Freccia del Vesuvio" from Milan to Rome and Naples. Both cover the 136 miles from Milan to Bologna in 109 min., at 74.9 m.p.h., the 60.2 miles of the Bologna-Florence *direttissima* line in 51 min., at 70.8 m.p.h., and 196.3 miles from Florence to Rome in 185 min., at 65.7 m.p.h.

The overall time for the 392.5 miles from Milan to Rome [almost identical with the distance from Kings Cross to Edinburgh Waverley] is 5 hr. 55 min. In the reverse direction the Rome-Florence timing is 175 min. (67.3 m.p.h.).

The "Freccia del Vesuvio" continues to Naples; over the 130.5 miles of the *direttissima* line between Rome and Naples Mergellina makes the fastest scheduled run in Italy, the 103 min. schedule demanding an average speed of 76 m.p.h. start to stop. This train leaves Milan at 8.50 a.m., and including 5 min. each at Bologna and Florence and 10 min. at Rome Termini, is due in Naples at 4.38 p.m.—7 hr. 48 min. overall and 7 hr. 28 min. actual running time for 523 miles, which makes it a very close rival to the

French "Mistral" and "Sud Express" over a distance exceeding 500 miles.

On the Rome-Leghorn-Pisa-Genoa line the *elettrotreno* "Tirreno" is booked over the 196.4 miles from Rome to Leghorn in 172 min., and in 182 min. in the reverse direction. Electrification also has produced some high speed timings on the Turin-Milan-Venice main line. The *elettrotreno* "Rialto" covers the 165.8 miles from Milan to Venice in 2 hr. 37 min. with three intermediate stops; the

train returns in the time of 2 hr. 33 min.

In general the fastest expresses over the principal Italian main lines are timed at higher speeds than the fastest in 1939; but there is a greater gap in speed between these and the remainder of the express services than before the war. The high speed trains in all cases are first class only and command supplementary fares. A postwar development is the large number of Italian long-distance trains that have received distinctive names.

Bridge Reconstruction in the L.M. Region

Use of four post-tensioned concrete box girders

At present the four tracks carrying the Crewe-Manchester line, London Midland Region, over Stockport Road in Manchester are carried by two separate bridges, one constructed in 1840, consisting of a cast iron centre span over the road with two masonry arches spanning the footpath either side. The other is a double track wrought iron girder bridge constructed in 1880 which spans between the abutments and is supported on intermediate cast iron columns placed in line with the masonry piers to the other bridge.

Both structures were reaching the stage where they had to be replaced, and as it was intended to place ballasted track over them as part of the track improvements made for the electrification of the line between Stockport and Manchester, it was decided to renew them before the electrification works reached this site.

They are being replaced by post-tensioned concrete box girders, each independently carrying one track and spanning between abutments only. This dispenses with both the original masonry piers and the cast iron columns, and improves road clearances. Editorial reference was made to this project in our issue of May 2, 1958.

Pre-Cast Box Units

Each of the box girders consists of 16 pre-cast box units weighing from 30 to 35 tons each, which are joined by cast-in-situ diaphragms and then post-tensioned with 16 Magnel-Blaton cables each containing 72 wires 0.276 in. dia. giving a total pre-stress force of 3,600 tons.

The girders, which are 7 ft. 6 in. deep excluding upstands, have a span of 107 ft. between inner bearings, and 139 ft. between outer bearings. The four bearings for each beam are each placed under a web of

the box section and because of the skew of the bridge are staggered with respect to its centre line. This results structurally in the beams acting as though they were each supported at four points, with considerable uplift forces at the outer bearings, and much increased reactions at the two inner bearings. The bearings are made up of layers of rubber and steel.

Erection of Units

The pre-cast units for each beam in turn are erected on a stage spanning the road built alongside the existing bridge. The in-situ diaphragms are then cast and the cables placed and stressed. The finished beam is jacked down and rolled on to temporary reinforced concrete columns where the difference in level at the positions of inner and outer bearings is checked while the whole load rests on the outer bearings, and the packings in the rubber bearings on the bridge abutments are then adjusted.

The existing structures are being replaced by temporary waybeams during the site work and these will be lifted out of each track in turn as the concrete beams are rolled into position at week-ends.

The whole of the work is being carried out to the instructions of Mr. J. Taylor Thompson, Chief Civil Engineer, London Midland Region, British Railways and the design prepared in the Regional Bridge Office under the direction of Mr. F. Turton, Assistant Engineer (Bridges). The main contractors are Leonard Fairclough Limited. Stressed Concrete Design Limited has prepared the detail drawings and calculations for the post-tensioned beams, and Anglian Building Products Limited is manufacturing the pre-cast units. The rubber bearings are being supplied by the Andre Rubber Company.



Pre-cast box units on staging before concreting of diaphragms



First beam on rolling-in carriage ready for jacking down

Questions in Parliament

London Fares

Mr. Geoffrey Wilson (Truro—C.) asked the Minister of Transport & Civil Aviation on June 30, in view of the significance to the national economy of passenger transport charges, and the effect of recent wage increases granted to transport workers in London, what general direction he proposed to give to the B.T.C. as to fares in the London area.

Mr. Harold Watkinson: No direction is necessary. The Chairman of the Commission told me on May 2 that there is not at present scope for obtaining a large increase in receipts by raising fares. The Commission intends to find the bulk of the cost of current wage increases in London, as on British Railways, from economies in working expenses. It does not propose to make any fare increases in London in the near future except, as has already been announced, by raising some scattered sub-standard fares.

The intention of the Commission to make limited increases on certain passenger fares also applies to London, where specially heavy costs arise in providing services for peak traffic. The Commission at present has no authority to raise fares as its present powers are exhausted. In order that the Commission may have headroom in charging powers to make any future adjustments, it intends to apply to the Transport Tribunal for the necessary authority later in the year.

Conference of Transport Ministers

Mr. Ernest Davies (Enfield E.—Lab.) asked the Minister of Transport & Civil Aviation on June 25 what action had been taken by the European Conference of Ministers of Transport in regard to Resolution 146, 1958, concerning its Fourth Report adopted at the Tenth Ordinary Session of the Consultative Assembly of the Council of Europe.

Mr. Harold Watkinson, in a written reply: This resolution, which deals with many of the important subjects covered by the Fourth Report of the European Conference of Ministers of Transport, will be considered in a preliminary way by the Conference when it meets in Paris later this week.

Consultations on Economies

Mr. Donald Wade (Huddersfield E.—Lib.) asked the Minister of Transport & Civil Aviation on June 18 what consultations he had had with the B.T.C. and representatives of the employees of British Railways on redundancy.

Mr. H. Watkinson, in a written reply: The B.T.C. is responsible for consultation with its employees on this question and I am satisfied that it is dealing with it through the established negotiating machinery and within the framework of the existing redundancy agreements where these apply.

Transport Users' Consultative Committees

Mr. Fenner Brockway (Eton & Slough—Lab.) asked the Minister of Transport & Civil Aviation on June 18 to publish in the Official Report the names of the members of the Transport Users' Consultative Committees for England, Scotland, and Wales, and particulars of any association they might have with organisations representing the travelling public.

Mr. G. R. H. Nugent said that this would be done.

Mr. Brockway also asked the Parlia-

mentary Secretary to use his influence with the Minister to make these committees more representative, more dynamic, and more effective. Not one in a thousand railway passengers had any knowledge of these committees, supposed to represent their interests.

Mr. Nugent: The representation on these committees conforms exactly with the terms of the 1947 Act. Membership of these committees was very fully representative of the general railway users.

Production of Steam Locomotives

Mr. D. Wade (Huddersfield E.—Lib.) asked the Minister of Transport & Civil Aviation on June 18 what percentage of employees engaged in the production of steam locomotives for British Railways would become redundant as a consequence of the reduction in, or cessation of production of, steam locomotives.

Mr. H. Watkinson, in a written reply: This is a matter for the B.T.C., which inform me that very little redundancy is expected, as in general men employed on the production of steam locomotives will be transferred, as some have already been, to work on diesel locomotives.

Express Schedules

Mr. Julian Snow (Lichfield & Tamworth—Lab.) asked the Minister of Transport & Civil Aviation on June 18, in view of the fact that in the four weeks ended February 22 only 39.7 per cent of British Railways expresses arrived on time and only 66.1 per cent within five minutes of booked time, and that both these percentages in any case were lower than for the same period last year, if he would give a general direction to the B.T.C. to institute a general revision of all schedules in the light of existing traffic conditions.

Mr. Watkinson: No. This is a matter for the Commission, which is already giving it special attention. The introduction of diesel and electric motive power will make it possible to accelerate some schedules. Until the many engineering works for modernisation are completed, they are bound to cause occasional delays which Regional managements are doing their best to keep to a minimum. The Commission does not consider that these temporary and varying delays can be allowed for by the revision of timetables brought out twice a year.

Railway Services to Gatwick Airport

Mr. Ernest Davies (Enfield E.—Lab.) asked the Minister of Transport & Civil Aviation on June 18 what consultation he had had with the B.T.C. and the civil aviation corporations with a view to speeding up railway communication with Gatwick Airport; and what steps it was proposed to take to that end.

Mr. Watkinson: The present service was planned in full consultation with B.E.A. While it meets the present traffic needs of the airport, the B.T.C. is at present looking into the possibility of providing more fast trains in the future, although improvements will be difficult on this busy line.

Mr. Davies: There are no non-stop express trains between Victoria and Gatwick Airport. The minimum time taken is 40 min., and many trains take longer. Some of the benefits of siting the airport where it is, with a new railway station, are lost.

Mr. Watkinson: This matter needs looking into again, and the Commission is doing so.

Staff and Labour Matters

Railway Workshop Staff

A meeting of the Railway Shopmen's National Council took place on June 26 at which the Commission's representatives gave their reply to the claim of the Employees' Side of the council for improved rates of pay of Railway Workshop staff.

An offer was made of an increase of 3 per cent in the rates of pay of Railway Shopmen with effect from June 30, 1958. This was subject to the position of Railway Shopmen's wages being reviewed as may be necessary in the light of future developments, including the proposed review of wages in the railway industry.

The Commission's representatives stressed that the cost of this settlement must be met out of the commission's own resources. The offer was made on the understanding that the trade union representatives re-affirmed their willingness to co-operate in the development of the modernisation programme and in measures necessary to secure the maximum productivity and economic working of the railway industry.

The Employees' Side stated it would consider the offer and a further meeting of the council was arranged for July 21, 1958.

London Busmen's Wage Claim

On June 30 the London Transport Executive, in negotiation with the Transport & General Workers Union, offered pay increases at 7s. 6d. per week for Green Line coach drivers with effect from June 21 (the day on which the strike ended), and increases of 5s. a week for country bus crews, garage maintenance staff and Green Line coach conductors. The 5s. offered, equivalent to about 3 per cent, would be paid from July 2.

These negotiations were part of the pay review which began just before the strike ended. Negotiations are to continue as the Transport & General Workers Union has stated that the offer is not sufficient. The union wants an increase nearer the 8s. 6d. given to the Central bus drivers by the Industrial Court.

London Transport has intimated that its offer is made on the understanding that the union would co-operate in reducing working expenditure and improving productivity. The cost of the increases offered is about £170,000 a year. This is to be met out of savings.

Agricultural Workers' Pay Claim

On June 25 the Agricultural Wages Board considered claims from farm workers' representatives for a substantial increase in minimum rates of pay and for a reduction in the standard working week.

The current minimum wage rate for an adult man in the industry, working a 47-hr. week, is 150s. This rate came into force last October.

The Wages Board adjourned until July 23, when the reply of the employers will be given.

RAILWAY BENEVOLENT INSTITUTION.—At a meeting on July 1, the board of the Railway Benevolent Institution granted annuities to eight widows and eleven members involving an additional liability of £416 12s. a year; 115 gratuities were also granted amounting to £1,132 10s. to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of May amounted to £1,712 15s.

Contracts and Tenders

Main-line diesel-electric locomotives required for Sudan

London Transport has placed a contract with William Old Limited, Harrow, for the reconstruction of bridge No. M.R.64 at Northwood, Metropolitan Line. The value of the contract is £27,600, and work is due for completion in 12 months.

British Railways, Eastern Region, has placed the following contracts:

Samuel Butler & Co. Ltd., Stanningley, Nr. Leeds: repairs to superstructure of train ferry terminal bridge at Harwich

Charles R. Price, Doncaster: repairs to timber walling on east bank of River Trent at Keadby

Wild-Barfield Furnaces Limited, Watford, Herts: supply and delivery of gas carburising plant for case hardening at Doncaster Carriage Works

British Vacuum Cleaner & Engineering Co. Ltd., Leatherhead, Surrey: supply, delivery and installation of vacuum cleaning plant, associated pipework and accessories at Ilford Electric Train Depot

Wellerman Bros. Ltd., Sheffield, 3: reconstruction of superstructure of overbridge No. 1 at Woodgrange Park Station

W. & C. French Limited, Buckhurst Hill, Essex: reconstruction of underline bridge No. 3 over Boy Giffit drain, between Mumby Road and Sutton-on-Sea.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From Sudan:

23 main-line diesel-electric locomotives.

The issuing authority is the Stores Department, Sudan Railways. The tender No. is 1785. The closing date is August 25, 1958. Tenders must be valid for two months after the closing date. Bids should be addressed to the Controller of Stores, Sudan Railways, Atbara. The Board of Trade reference is ESB/16442/58.

From South Africa:

20 items of non-ferrous overhead track equipment fittings, including catenary dropper clips, contact dropper clips, contact swivel clips, parallel clamps, feeder clamps, contact wire splicers, and brass split pins.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. C.7230: Non-Ferrous Overhead Track Equipment Fittings" should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is July 18, 1958. Local representation is essential. The Board of Trade reference is ESB/15406/58.

From Korea:

93,000 untreated timber sleepers, 7 in. x 9 in. x 8 ft.

100 sets of preservative treated timber sleepers, 7 in. x 9 in. and lengths varying from 8 ft. 6 in. to 15 ft. 6 in. for No. 8 turnouts

80 sets of preservative treated timber sleepers, 7 in. x 9 in. and lengths varying from 8 ft. 6 in. to 15 ft. 6 in. for No. 10 turnouts

1,700 preservative treated timber

sleepers, 7 in. x 9 in. and lengths varying from 9 ft. to 14 ft. 6 in.

The issuing authority and address to which bids should be sent is the Office of Supply, Government of the Republic of Korea, Seoul, Korea. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The tender No. is 89-99-LI-8223. The closing date is July 25, 1958. The Board of Trade reference is ESB/16501/58/I.C.A.

From Turkey:

126 forged raw axles, various sizes
191,000 welding rods of various types.

The issuing authority is Devlet Demir Yollari, Malzeme Dairesi Reisligi, Ankara, Turkey. The tender No. is 77-99-LI-8250. The closing date is July 18, 1958. This purchase will be financed by the International Co-operation Administration (I.C.A.), the agency through which the United States Government gives economic

and technical assistance to other countries. The Board of Trade reference is ESB/15849/58/I.C.A.

From Thailand:

26 fireboxes for "MacArthur" locomotives in accordance with drawing No. 380.S3-2095.

The issuing authority is the Railways Organisation of Thailand. The tender No. is 01138. Bids should be sent to the Railways Organisation of Thailand, Bangkok. The closing date is July 18, 1958. A deposit of Bht.28,000 must be submitted with bids. The Board of Trade reference is ESB/16126/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1.).

The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing date of the call for tenders from South Africa for main-line passenger coaches, recorded on page 636 of our November 29, 1957, issue, has been further postponed to July 18, 1958.

Notes and News

Extension of North Eastern Region Export Traffic Service.—In connection with the drive to increase export traffic, British Railways, North Eastern Region, export express service has been extended to include services for full truck loads of export traffic via the Liverpool and Manchester docks. The new service gives an assured next-day arrival and is available from 25 selected stations in the Region.

New B.R.S. Depot Opened at Queensferry.—A new British Road Services, North Wales Branch, depot at Queensferry, Flintshire, was opened on June 27 by Lord Rusholme, a Member of the British Transport Commission and Chairman of the Road Haulage Sub-Commission. Covering an area of some three acres, and embodying office, warehouse, and workshop accommodation, the new depot is about five miles north-west of the former depot at Bretton, which it now replaces because of the increasing needs of road transport in the North Wales area,

and the development of articulated vehicles. Among those who attended last Friday's opening by Lord Rusholme were: Major-General G. N. Russell, Chairman & General Manager of British Road Services; Messrs. R. F. Summers, Chairman, J. Summers & Sons Ltd., Shotton, and a Member of the B.T.C. London Midland Area Board; W. E. Macve, Divisional Manager, B.R.S.; M. G. E. Lambert, Divisional Traffic Manager, British Railways, London Midland Region, Liverpool; F. H. Fisher, District Traffic Superintendent, L.M. Region, Chester; W. J. Crosland-Taylor, General Manager, Crosville Motor Services Limited; and D. S. M. Barrie, Chief Public Relations Officer, British Transport Commission.

Private Transport Competition with Buses.—At the annual general meeting of Southdown Motor Services Limited, the Chairman, Mr. R. P. Beddow, stated that the company was facing ever increasing competition from the private motor-car, motor-cycle, scooter, and power-assisted bicycle. This trend towards ownership of



Entrance from Chester Road to new B.R.S. Depot at Queensferry

individual private transport, brought about by the improvement in the standard of living and the change in social habits consequent upon the growth of television viewing, he said, were the major factors accounting for the continuing decline in the number of passengers carried. Of the company's stage carriage mileage, 47 per cent produced revenue below the average cost of operation, compared with 35 per cent in the previous year.

German-Built Railbuses in Eastern Region.—The five railbuses built by the German firm of Waggon und Maschinenbau G.m.b.H. for trials with British Railways, are to be placed in service in the Eastern Region on Monday. These lightweight vehicles, described in our issue of May 23, will be used on branch lines of the Region and will be based at Cambridge. Initially they will run on the Witham-Maldon, Witham-Braintree and Audley End-Bartlow services. The accompanying illustration shows one of the railbuses at Witham station.

Scottish Region Passenger Service Alterations.—Further economies will be effected by changes in British Railways, Scottish Region services announced by Sir Ian Bolton, Chairman of the Scottish Area Board of the B.T.C. It is proposed to replace some lightly loaded steam services with diesel units, thus modifying the Glasgow suburban services and withdrawing unremunerative services in all parts of the country. Passenger trains in Scotland ran approximately 20,000,000 miles a year. Five per cent, or 1,000,000 miles, are to be converted from steam to diesel, and another five per cent withdrawn, all from off-peak hours. Most of the changes take effect from July 7, and the others from July 14 and 28. They will not affect the special programme of additional holiday trains. Sir Ian Bolton has stated that the diesel replacements will be carried out immediately by spreading the available diesels over a number of services and



One of five 150-h.p. railbuses built by W.M.D. at Witham Station, Eastern Region; they are to be placed in service next week

postponing the introduction of some more intensive services. The Glasgow suburban services will be reduced by closing several lines, including the Cathcart Circle, after approximately 7 p.m. on Mondays to Fridays and after 2 p.m. on Saturdays. Mr. S. E. Raymond, Chief Commercial Manager of the Region, has pointed out that the changes will not involve redundancy. Steps would be taken to cover that position by regulating recruitment.

Loss on New Zealand Government Railways.—Mr. M. Moohan, the Minister of Railways, speaking at a recent sitting of the New Zealand House of Representa-

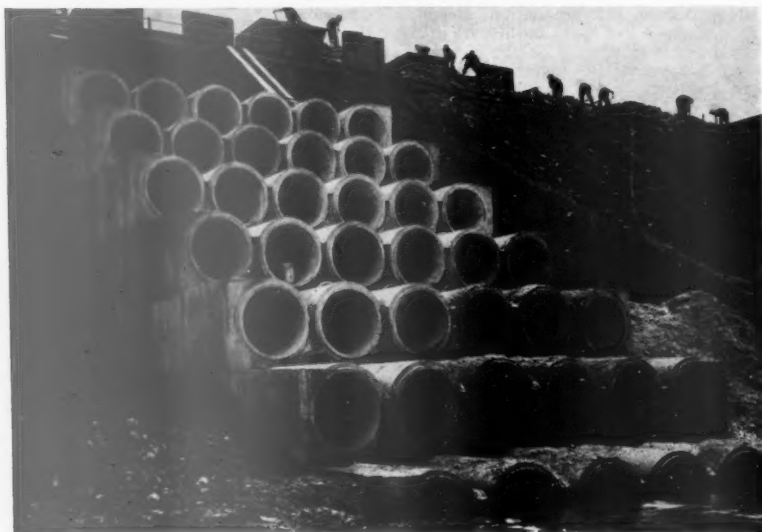
tives said that the loss on the New Zealand Government Railways was estimated to be £2,800,000 for this year. The loss on the South Island system last year was £1,800,000, but the North Island system made a profit of £773,199, resulting in an overall loss of £1,145,000. Mr. Moohan said that the House had to decide what was loss and what was service. He was "astounded" at the loss in the South Island, and had gone to some trouble to find out the reasons. When the railways were first started in the South Island there was no other means of transport. Now the population had grown and there was competition from motorcars and the air.

Workers' Educational Association: Railway History Course, 1958-59.—In the paragraph on page 755 of our issue of June 27 referring to the Workers' Educational Association Railway History Course, we gave the date of 1957 in error under the item, "the growth of railway communication in Great Britain." It should have been 1597.

Ruston & Hornsby Limited Results.—The group income of Ruston & Hornsby Limited, oil and gas engine manufacturers, for the year ended March 31, totalled £2,414,205 against £2,414,818 for 1956-57, including a trading profit of £2,107,789 (£2,043,288). Net profits were £645,684 (£693,956) of which the subsidiary companies retained £139,680 (£81,300). The ordinary dividend is being maintained at 9 per cent.

Improved Carriage Cleaning and Servicing Facilities at Stratford.—A scheme, to improve carriage cleaning and servicing for the London-East Anglian train services, of the Great Eastern section of the Eastern Region, and also to obtain economies in operation, has been introduced. This has the effect of concentrating the hitherto dispersed facilities. Previously there were several sets of carriage sidings at Stratford, East London. These were at Thornton Fields, Temple Mills, and Channelsea. Dispersal of carriages over the three siding groups made for uneconomical use of staff and engine power. By concentrating

Viaduct Replaced by Cellular Embankment



Elton Viaduct, on the Crewe to Manchester line of the London Midland Region, showing pipes in position on June 12 (see our May 9 issue)

empty carriage stabling and working at Thornton Fields, empty stock movement has been avoided and there has been a reduction in shunting engine hours. The scheme has enabled the Temple Mills sidings to be closed completely and the Channelsea sidings to be staffed by one man per shift. There are now 51 sidings at Thornton Fields giving accommodation for 549 coaches. Installations for the vacuum cleaning of compartments, for the charging of batteries and for the steam heating of carriages have been provided. Equipment for the testing of the vacuum brake and watering points for tank filling and cleaning have also been installed.

Hackbridge & Hewitt Electric Ordinary Dividend Maintained.—Hackbridge & Hewitt Electric Co. Ltd. has declared a final ordinary dividend of 15 per cent payable on August 7. The company has thus maintained the total dividend at 20 per cent. Net profits were £164,816 (against £153,499) after all charges.

Level Crossing Accident Near Staines.—The 2.42 p.m. electric train from Waterloo-Weybridge, Southern Region, hit closed level crossing gates at Pooley Green, between Staines and Egham, last Monday afternoon. Some pieces of the gates are reported to have been thrown some 25 yd., but there were no casualties. The gates were set against the train because a coal lorry driver had stopped his vehicle, with its front wheels on the up line, to retrieve two sacks of coal which had fallen off.

Birmingham Waterways Depot Wins Challenge Shield.—A Challenge Shield for "the best all-round depot in British Waterways for 1957" has been won by the Sampson Road Depot, Birmingham, South Eastern Division. The shield is awarded annually in an efficiency competition which takes into account commercial success, general efficiency, drive and energy, good housekeeping, cleanliness, and appearance; it is to be presented to the Sampson Road Depot Superintendent today (Friday) by Sir Reginald Kerr, General Manager, British Waterways.

Permanent Way Institution Convention.—Representatives of overseas railways at the annual summer meeting and convention of the Permanent Way Institution held last month at Weston-super-Mare, as recorded in last week's issue, included Mr. J. L. A. Cuperus, of the Netherlands Railways; also, present this year for the first time, three representatives from Verband Deutscher Eisenbahn-Ingenieure E.V. (Guild of German Railway Engineers), Messrs. Herold, Lindhorst and Gantenberg. This was in return for the hospitality accorded to three P.W.I. members last year who were invited to attend the convention at Cologne. Mr. J. L. Hoorweg, Chief Civil Engineer, Netherlands Railways, and President, Netherlands Way & Works Association, was prevented by an accident from attending.

The Future of B.I.C.E.R.A.—The June issue of the BICERA Bulletin states that there has been considerable discussion recently about the future prospects of the British Internal Combustion Engine Research Association, especially as it has been realised that increases in expenditure are inevitable. Although an encouraging number of member companies were prepared to pay increased subscriptions, it is felt that this step should be regarded as a last resort. Two other possible lines of action have been investigated: these are

a suggested merger with the Motor Industry Research Association, with which B.I.C.E.R.A. has always had a close relationship; and an extension of research and development of some of the Association's devices. This latter proposal has been received favourably. The Association states: "It is hoped that the resulting additional finance will be sufficient to avoid the necessity for an increase in the general contribution rate and that the new fields of investigation will be of a general benefit to the industry."

Western Region Poster Wins Award.—The photo-litho poster in six colours, reproduced in the accompanying illustration, was produced from an original painting by J. P. Power by the Public Relations & Publicity Department of the Western Region of British Railways, in conjunction with the local authorities. It has been awarded the Tattersall Trophy by the Association of Health & Pleasure Resorts, as the outstanding resort poster of 1958. It was printed by Waterlow & Sons Ltd.; 2,000 copies will be displayed throughout British Railways during 1958-59.

Satisfactory Year for C. C. Wakefield & Co. Ltd.—In the chairman's statement at the annual meeting of C. C. Wakefield & Co. Ltd., Mr. L. W. Farrow stated that the group trading profit of £3,098,423, £255,459 less than 1956, is satisfactory having regard to the unfavourable trading conditions brought about by the Suez crisis at the early part of 1957. The net group profit after taxation is £906,560 (£691,883). A final dividend of 17½ per cent, less tax, is recommended, making a total of 27½ per cent, as for last year.

Acceptance Trials of Associated Humber Lines Vessel.—The accompanying illustration shows the mv. *Bolton Abbey*, which recently underwent acceptance trials before entering service with the Associated Humber Lines Limited. The vessel was constructed by Brooke Marine Limited, a subsidiary of Dowsett Holdings Limited, and launched on December 11, 1957. The largest ship ever built and launched at Lowestoft, it is the first of two short-sea cargo/passenger vessels to be constructed by the company for the Hull-Rotterdam service.



Mv "Bolton Abbey" built for the Associated Humber Lines Hull-Rotterdam service



Western Region poster awarded the Tattersall Trophy for the outstanding resort poster of 1958

Economy Cuts in Inter-Regional Trains.—Several trains running to or from Southern Region stations in the south west are affected by the cuts in Western Region passenger services effective from last Monday. They include the 10.33 a.m. Weymouth to Wolverhampton and 11.5 a.m. Wolverhampton to Weymouth, which now run on Fridays and Saturdays only in summer and will be discontinued in the winter; also the 10.10 a.m. Cheltenham to Southampton Terminus, discontinued on Mondays to Fridays and running between Andover and Southampton only on Saturdays. The 4.50 p.m. Southampton to Cheltenham terminates at Andover, and the 10.10 a.m. from Southampton to Cheltenham and 5.25 p.m. Cheltenham to Andover are discontinued. Others which ran between the Southern and Western

Regions and are now discontinued include several on the Didcot Newbury & Southampton, Taunton to Yeovil, and Taunton to Barnstaple lines.

British Electric Traction Co. Ltd. Results.

—The aggregate group profits of British Electric Traction Co. Ltd. for the year ended March 31, showed a reduction of £236,000 at £3,687,219. After allowing for tax of £1,803,621 (£1,782,872) and minority interests in subsidiaries, the proportion of profit attributable to the parent company was £1,619,878 (£1,769,025). The reduction in profit was due to the adverse results of the Canadian subsidiary in 1957. The total deferred and "A" deferred ordinary dividends remain unchanged at 25 per cent.

Thomas De La Rue & Co. Ltd. Results.

Thomas De La Rue & Co. Ltd. has announced a final dividend of 12½ per cent for the year ended March 30. Allowing for the interim payment of 10 per cent on the capital before the 100 per cent scrip issue, the total payment is equivalent to 17½ per cent, which is effectively the same as the 35 per cent paid on the smaller capital for the previous year. Net profit increased from £504,212 to £549,868 and the surplus of £400,000, arising out of the take-over of the minority interests in the plastics business by Formica Limited, has been credited to capital reserve.

Triplex Changes of Name.—Triplex Safety Glass Co. Ltd. has changed its name to Triplex Holdings Limited. Triplex (Northern) Limited has changed its name to Triplex Safety Glass Co. Ltd., and owns the safety glass factories at Eckershall Road, King's Norton, Birmingham, 30; Eccleston, St. Helens, Lancs.; 43-44, Hythe Road, Willesden, London, N.W.10; and the Fundamental Research Laboratory at Holly Grange, Balsall Common, Warwick. Triplex (Northern) Limited (as such) no longer exists and all statements for goods supplied to that Company up to and including June 30 are being paid by Triplex Safety Glass Co. Ltd. Purchase orders are being placed by the individual factories to which goods, advice notes, and invoices should be sent. Statements should be addressed to Triplex Safety Glass Co. Ltd., 43-44, Hythe Road, Willesden, N.W.10.

Railway Stock Market

An easier tendency in sterling and moderate declines in British Funds affected sentiment in stock markets generally, where buying interest was less in evidence, partly because of competition from new issues. There seems little doubt that the F.B.I. warning of more difficult conditions in industry have emphasised to investors that profits of a wide range of companies are running at lower levels, and that in the circumstances, there is only limited scope for higher dividends. On the other hand, in general it should be possible to keep dividends at last year's levels. Should a stimulus to industry become necessary, a further cut in the bank rate can be expected before long. Also, gradual easing of the credit squeeze is believed in the City to be likely. In the circumstances, it can hardly be argued that most industrial shares are over-valued at current prices. In general, yields are still not unattractive, but a general upswing in production and earnings until next year seems improbable.

Foreign Rails, where changed, reflected the easier trend in stock markets, and Canadian Pacific were back to \$48½, compared with \$51½ a week ago; the preference stock at 52½ and 4 per cent debentures at 65½ were fractionally easier. White Pass shares have receded from \$13½ to \$13.

Costa Rica ordinary shares changed hands at 16½ and the first debentures at 74½, while Chilean Northern 5 per cent first debentures marked 39½. San Paulo Railway 3s. units were 2s. 1½d. and United of Havana second income stock was 6½, while Mexican Central "A" bearer debentures showed firmness at 69½.

Recent gains in engineering and kindred shares attracted some profit-taking; but Beyer Peacock 5s. shares have strengthened to 8s. 1½d., G. D. Peters changed hands at 22s. 3d. and Gloucester Wagon 10s. shares were 15s. with Wagon Repairs 5s. shares 11s. 1½d. Westinghouse Brake remained more active, but have reacted sharply from 40s. 6d. to 39s. 3d. Birmingham Wagon lost 6d. at 15s. 6d., but North British Locomotive at 13s. held last week's rally. Charles Roberts 5s. shares were higher at 8s. 7½d.

Associated Electrical shares reflected some profit-taking following the success of the big issue of 6 per cent debentures, and were 49s. 9d., compared with 50s. 6d. a week ago; the debentures touched a premium of 35s. but later it narrowed to 30s. General Electric shares eased on balance from 34s. 3d. to 33s. and English Electric from 53s. to 52s. 3d., while B.I. Cables came back to 43s. 3d. and Crompton Parkinson 5s. shares from 10s. 9d. to 10s. 4½d. British Oxygen strengthened afresh to 35s. Metal Industries advanced further from 30s. 10½d. to 32s. helped by the results, Ruston & Hornsby at 26s. 6d. were also firm on the past year's good figures, while British Aluminium have been steady at 44s. Renold Chain shares were 34s. 1½d. following the offer of additional shares at 30s. each—three for every eight held. The issue will bring in £2,000,000 for completion of the group's expansion programme. Sir Charles Renold, the chairman, states that the directors hope to keep the dividend at 12½ per cent on the larger capital. In other directions, T. W. Ward held their rise to 77s. 3d., Scottish Cables 4s. shares were 14s. 6d., and Vokes 4s. shares 15s. 3d. J. Stone Holdings have advanced strongly to 51s. in response to news of negotiations for a merger with Platt Bros.

Vickers at 30s. 1½d. fully held their recent rise. Dowty Group 10s. shares were 31s. 6d., compared with 31s. 10½d. a week ago, F. Perkins 10s. shares, 8s. 10½d. compared with 9s. 1½d. and Pressed Steel 5s. shares eased from 15s. 3d. to 15s. British Timken strengthened to 47s. 6d., Birmid Industries were 68s. and Butterley 2s. 6d. shares 15s.

Forthcoming Meetings

- July 11 (Fri.).—Permanent Way Institution, Manchester & Liverpool Section, Visit to Woodhead Tunnel and installations. Buses will leave Manchester Central Station, at 6.30 p.m.
- July 19 (Sat.).—Permanent Way Institution, London Section. Visit to H.M. Dockyard, Chatham.
- July 26 (Sat.).—Permanent Way Institution, Manchester & Liverpool Section, in the Ambulance Rooms, Nantwich Road, Crewe, at 2.30 p.m. Talk on "The Manchester-Crewe Modernisation," by Mr. T. Mylro.

OFFICIAL NOTICES

ENGINEER.—Young engineer required to assist in supervising the engineering departments of a large tramways undertaking operating in India. The Company is registered in Great Britain. He will be expected to take an active interest in all departments, under the guidance of the Company's General Manager residing in Calcutta, and will be called upon to take full control of any one department when the officer in charge is on leave. The position carries a commencing salary of Rs. 2,000/- per month, plus dearness allowance of Rs. 450, together equivalent to £2,205 per annum. Four months leave per every two years with first-class sea or air passage. Generous assistance given in obtaining accommodation, use of car and membership of the Provident Fund, medical and other expenses as provided for in the Company's Rules. Applications from young energetic engineers, of British Nationality, age 25 to 30 years, who have had a sound general mechanical and/or electrical training, giving full details of education, training, practical experience and any qualifications, should be sent to the undermentioned address, not later than one month from date of this issue.—Secretaries, The Calcutta Tramways Company, Ltd., 30, Cursitor Street, London, E.C.4.

THE NIGERIAN RAILWAY CORPORATION.

BORNU LINE EXTENSION.—Consequent upon the loan from the International Bank of Reconstruction and Development, the contract for the construction of the first part of the 400 miles Bornu Extension has been let and the Nigerian Railway invites applications for the posts listed below:—

SENIOR ASSISTANT ENGINEERS.—Salary Scale, £1,875 by £50 per annum to £2,075.
ASSISTANT ENGINEERS.—Salary scale, £1,100 by £50 per annum to £1,900. Candidates for both these posts should preferably be Corporate Members of the Institution of Civil Engineers, but this is not essential if a candidate has had extensive practical and constructional experience in railway engineering, bridge work and general reinforced concrete.

ACCOUNTANTS.—Salary Scale, £1,100 by £50 per annum to £1,900. Candidates should hold a recognised accounting qualification and not less than five years' practical accounting experience, since qualifying, or the intermediate examination of a recognised accounting body and 10 years' practical accounting experience.

SENIOR DRAUGHTSMEN (PERMANENT WAY).—Salary Scale, £1,450 by £50 per annum to £1,750. Candidates must have had experience in the New Works or Permanent Way Section of a first class railway or with a manufacturing firm which supplies Railway Permanent Way components. They should be able to prepare Bills of Quantities and Specifications.

CAMP COMMANDANTS.—Salary Scale, £1,450 by £50 per annum to £1,750. The Camp Commandants will be responsible for the non-technical administration of the new construction camps and should have had at least 10 years' experience of camps and administering personnel, and a good knowledge of store-keeping. Preference will be given to candidates who have had experience in military or civil establishments in tropical countries.

PLANT FOREMEN.—Salary Scale, £1,000 by £50 per annum to £1,500. Candidates must have had extensive experience in the maintenance and general overhaul of all tools and plant used in a civil engineering department, including petrol and diesel engines, quarrying plant, road rollers, Coles cranes and earth moving machinery. Candidates should also have had experience in indenting for spares and the supervision of fitters.

ENGINEERING STORES OFFICERS.—Salary Scale, £1,000 by £50 per annum to £1,400. Candidates must possess a sound knowledge of the procedure of receiving and issuing stores and have a knowledge of stores accounting, permanent way materials and civil engineering plant and spares. Previous railway experience is desirable.

Salary: All salaries quoted are inclusive of £300 overseas pay. **Gratuity:** All appointments are on a contract basis with a gratuity of 20 per cent. per annum of total pay, payable on completion of the contract. **Tours:** 15 months in Nigeria followed by 15 weeks' leave on full pay. **Quarters:** Fully furnished quarters are provided at low rental. **Allowances:** There are attractive family, travelling, transport and other allowances.

Send postcard before 18th July, 1958, mentioning the post in which interested and this paper, for further particulars and application form, to: The London Representative, Nigerian Railway Corporation, Nigeria House, 9, Northumberland Avenue, London, W.C.2.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tottill Press, Limited, 33 Tottill Street, London, S.W.1.

